

# *and* **ROADS STREETS**

**HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION**

**A GILLETTE PUBLICATION**

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Contractor and Traffic Take Turns . . . page 47

New Ripping Method for Rock . . . page 62

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**May 1958**

# why Yale & Towne powers with Chrysler Industrial Engines



CHRYSLER V-8  
INDUSTRIAL ENGINE  
powers Yale G3P  
Lift Truck.

Lift trucks operate under a wide variety of rugged conditions. The Yale Model G3P, for example, usually works outdoors in all kinds of weather and, frequently, over rough terrain. The engine is exposed to rain, dust, dirt; extreme heat and cold. Demands upon the engine vary from short periods of full capacity lifting to long periods of idling. Yale & Towne has found that Chrysler engines meet these on-the-job requirements with power to spare. Most Yale customers are familiar with Chrysler power in other industrial applications. They respect the reputation of Chrysler Industrial Engines for economical and trouble-free performance. They know from first hand experience how Chrysler's nationwide service organization helps reduce down-time losses.

## YALE & TOWNE EXECUTIVES

John A. Baldinger (left) General Manager, Materials Handling Division; Thomas W. Curtin (right) Director of Purchases; Clyde R. Dean (seated) General Sales Manager. Yale Lift Trucks from 3,000 to 10,000 lb. capacity are powered by six-cylinder Chrysler Industrial Engines. Larger models (shown: Model G3P, 18,000 lb. capacity) are powered by Chrysler V-8 Industrial Engines with fluid coupling.



SEND for 1958 CHRYSLER  
INDUSTRIAL ENGINE CATALOG:  
Dept. G5, Industrial Engine  
Division, Chrysler Corporation,  
Detroit 31, Michigan.

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# Chrysler

## INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION





## Light-weight Beth-Cu-Loy Pipe is so easy to install

Here you see a 14-ft length of corrugated galvanized Beth-Cu-Loy pipe being moved to location by only two men. Made of 16-ga sheet steel, this section weighs but 214 lb; larger sections in heavier gages can be handled by the simplest kinds of lifting devices.

The advantages of such light weight make possible quick and economical drainage installations. First of all, light-weight pipe is cheaper to ship. Smaller diameters can be nested inside larger ones, and it is entirely possible to load more than a quarter-mile of pipe on one truck!

At the job-site, Beth-Cu-Loy pipe's long lengths reduce the number of field joints. Pipe-laying can keep right up with the trenching. And it's an easy operation, again because of the pipe's light weight. Large crews of men and costly hoisting equipment are not needed for installation.

Pipe made of Beth-Cu-Loy is strong, too, because Beth-Cu-Loy is steel. A uniform coating of Prime Western zinc provides corrosion-resistance that protects the pipe for many years. You can generally figure on a culvert of this type outlasting the original project for which it was designed.

Beth-Cu-Loy sheets for drainage pipe and culverts are made by Bethlehem to AASHTO specifications. Any of our fabricators will be glad to give you further information about Beth-Cu-Loy sheets and how they can be used to meet your drainage engineering needs. For the name of a fabricator near you, just get in touch with us.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation

# BETHLEHEM STEEL



# ROADS AND STREETS

A GILLETTE PUBLICATION

MAY, 1958

VOLUME 101

NUMBER 5

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Review of the factors which enter into selection of drill types and sizes for highway and related rock excavation work.

### Maintenance of Expressways—how far to go?

The new Interstate highways, both urban and inter-city, will require special management compared to ordinary arterial highways. A report on the first regional conference on this subject, as held by the Institute of Traffic Engineers.

### Field Reports on Many Projects—

Look for other special reports on timely problems of interest to both the engineer and the contractor, gleaned from this record-breaking year of road and street construction activity.

Look for this nearby  
Goodyear dealer sign  
for better tire values  
— better tire care.



ARCOLE MIDWEST CORPORATION, Evanston, Ill., is its own biggest subcontractor. Building highways, bridges and other super-projects at a multimillion-dollar-a-year clip—Arcole does everything except electrical work and painting—everything from earth-moving, to concrete, to landscaping—entirely within its own organization! This takes a fleet of hundreds of trucks, many rubber-tired scrapers, an army of other equipment—and real "teamship"! Loader shown here rolls on SURE-GRIP by Goodyear



**TIRE INSPECTION** and maintenance never let down. Here, a new **HARD ROCK LUG**, by Goodyear, is being carefully checked in

## Here's why Triple-Tough 3-T Nylon Cord Tires move more yards for less:

ALL 3-T NYLON CORD — TUBELESS OR TUBE-TYPE



Like steel, tire cord must be tempered to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, triple-temper cord to make it TRIPLE-TOUGH—to give you longest tire life, lowest cost-per-yard.

TRIPLE-TOUGH 3-T NYLON CORD—a Goodyear exclusive—is the greatest tire *saver* in 23 years.

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THIS SAVES YOU the expense of idle men and equipment. Final tire cost can also hit new LOWS because 3-T Nylon Cord keeps tires strong for recap after recap.

Test this Goodyear performance—made possible by TRIPLE-TOUGH 3-T NYLON CORD—against any tires on any jobs. We'll rest our case on your findings. Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify Tubeless or Tube-Type

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ROADS AND STREETS, May, 1958



**always a  
bigger bite**

Weight concentration in the lower center section eliminates top heaviness. Combined with 6 part block and tackle reeving, it gives OWEN Buckets that extra power to dig in at the beginning—and to continue to dig with equal force on both jaws during the entire closing cycle. At the end of the stroke, there is no power loss and lifting tendency is at a minimum.



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## ROADS AND STREETS

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**Big loading capacity, too!**  
Front-end loader for International  
W 450 tractor handles  $\frac{3}{4}$  cu yd  
material bucket, lifts 2,500 pounds.



## There's a full $\frac{1}{2}$ cu yd in that backhoe bucket!

The big, brawny International W 450 tractor gives you backhoe capacity approaching that of small power shovels, with wheel tractor economy and mobility . . . PLUS front-end loader or dozer, all in one unit!

The 60 hp\* International W 450 tractor has the built-in weight and strength to handle an International Pippin backhoe with  $\frac{1}{2}$  cu yd heaped bucket capacity. At a modest increase in investment over smaller, lighter tractors, you can practically double dirt moving capacity for trenching, footings and basement excavations. For fast loading, the regular backhoe bucket can be replaced by an 8 cu ft shovel bucket.

\*Net flywheel hp with engine accessories installed.

Your nearby IH Dealer can match your tractor-backhoe-loader needs exactly from four tractor power sizes, 40 to 68 engine hp, with matching International Pippin and International Wagner backhoes and loaders. Phone him for a demonstration!



**Now! "central station" electric power on wheels!** The International W 450 may be equipped with ElectraII®, mounted as shown in red. ElectraII powers any equipment normally operated from a 5 to 7½ kva high-line transformer. Trailing ElectraII can be pto-operated by any tractor of 30 hp or larger.

### FOR MORE INFORMATION . . .

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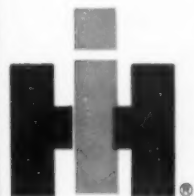
- ☐ 40 hp 330 Utility tractor
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- ☐ International ElectraII
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pays significant dividends in maintenance savings

## **Texaco Simplified Lubrication Plan**

**Plan can reduce lubricant inventory and improve lubrication. It can mean more productive man-hours, less repair costs, less time lost**

If you are using more than six lubricants for your major lubricating jobs, chances are your maintenance costs are a lot higher than they should be. Storage problems, handling costs, and the dangers of mis-

application are often costly results of stocking more lubricants than you need.

### **Texaco Plan cuts number of lubricants needed**

Specifically tailored to your operation by your local Texaco Lubrication Engineer, this new plan can cut your requirements to not more than six lubricants for *all* your major lubrication needs. Yet the



The Texaco Simplified Lubrication Plan is saving maintenance dollars on this big power house project. This impres-

sive excavation is over 4,000 feet long and between 40 and 90 feet deep.

Plan is simple to put into action; it works smoothly; and above all, it will save you a significant amount of money.

#### How the Texaco Plan works

The Texaco Simplified Lubrication Plan is based on a proven combination of multi-purpose lubricants — varied to meet the particular requirements of your job. Your Texaco Lubrication Engineer will work with you, going over all your lubrication needs to see that your operation gets the *best* in modern lubrication with the *minimum* number of lubricants.

#### Get the complete story

Your nearest Texaco Lubrication Engineer can

give you complete information on the Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States; or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

**TUNE IN...** Metropolitan Opera Radio Broadcasts Every Saturday Afternoon



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(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

**ROADS AND STREETS, May, 1958**



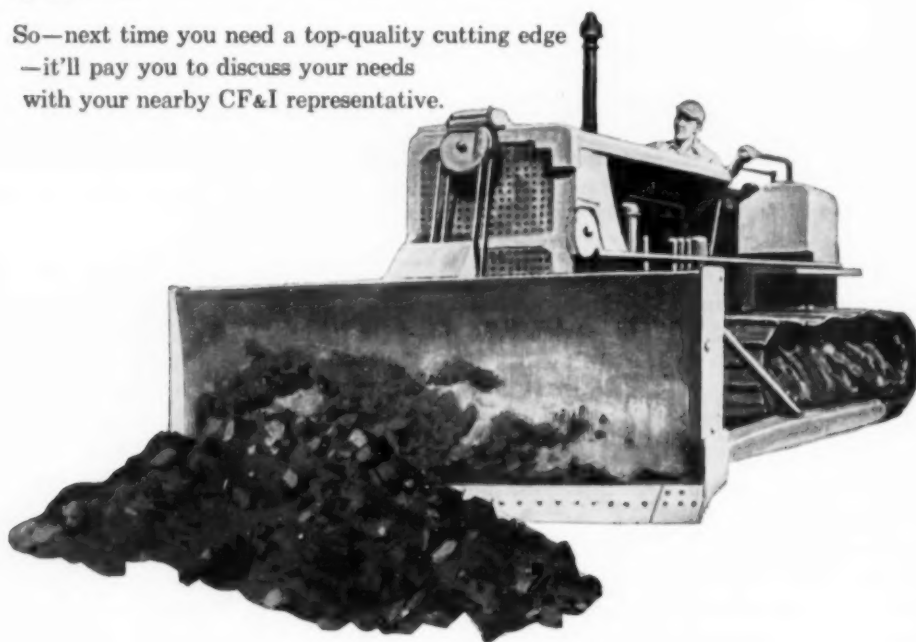
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**Call**  
**the district**  
**office nearest**  
**you for**  
**B.F. Goodrich**  
**tires and**  
**tire service**



# tires and tire service cut operating costs!

## FLEX-RITE NYLON cords give you more retreadable tires

More and more contractors are switching to B.F. Goodrich because B.F. Goodrich gives them:

1. Longer-wearing, trouble-free tires, no matter what the job.
2. Complete, on-the-job tire service and fast, expert tire repairing and retreading.

B.F. Goodrich tires wear longer and give you more retreads because of exclusive B.F. Goodrich FLEX-RITE NYLON. This cord material withstands double the impact of ordinary materials. It resists heat blow-outs and flex breaks. The result: you get more retreadable tires—and more retreads per tire—with B.F. Goodrich.



FLEX-RITE NYLON cord construction is available in all B.F. Goodrich off-the-road tires. It's just one reason why you save money when you see your B.F. Goodrich dealer. He has a B.F. Goodrich tire for every off-the-road job.

**Specify B.F. Goodrich Tubeless or tube-type tires when ordering new equipment**

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A Division of The B.F. Goodrich Co.,  
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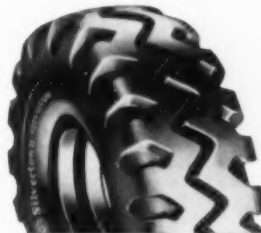
**SUPER TRACTION** for power wheels on large dirt-moving rigs. Tubeless or tube-type. 18.00-24 through 27.00-33.



**UNIVERSAL** for power or free-rolling wheels on trucks, scrapers, trailers. Tubeless or tube-type. 7.00-15 to 24.00-29.



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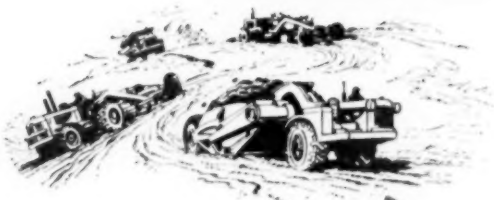


Lift the page for complete information on money-saving B.F. Goodrich on-the-job tire service!

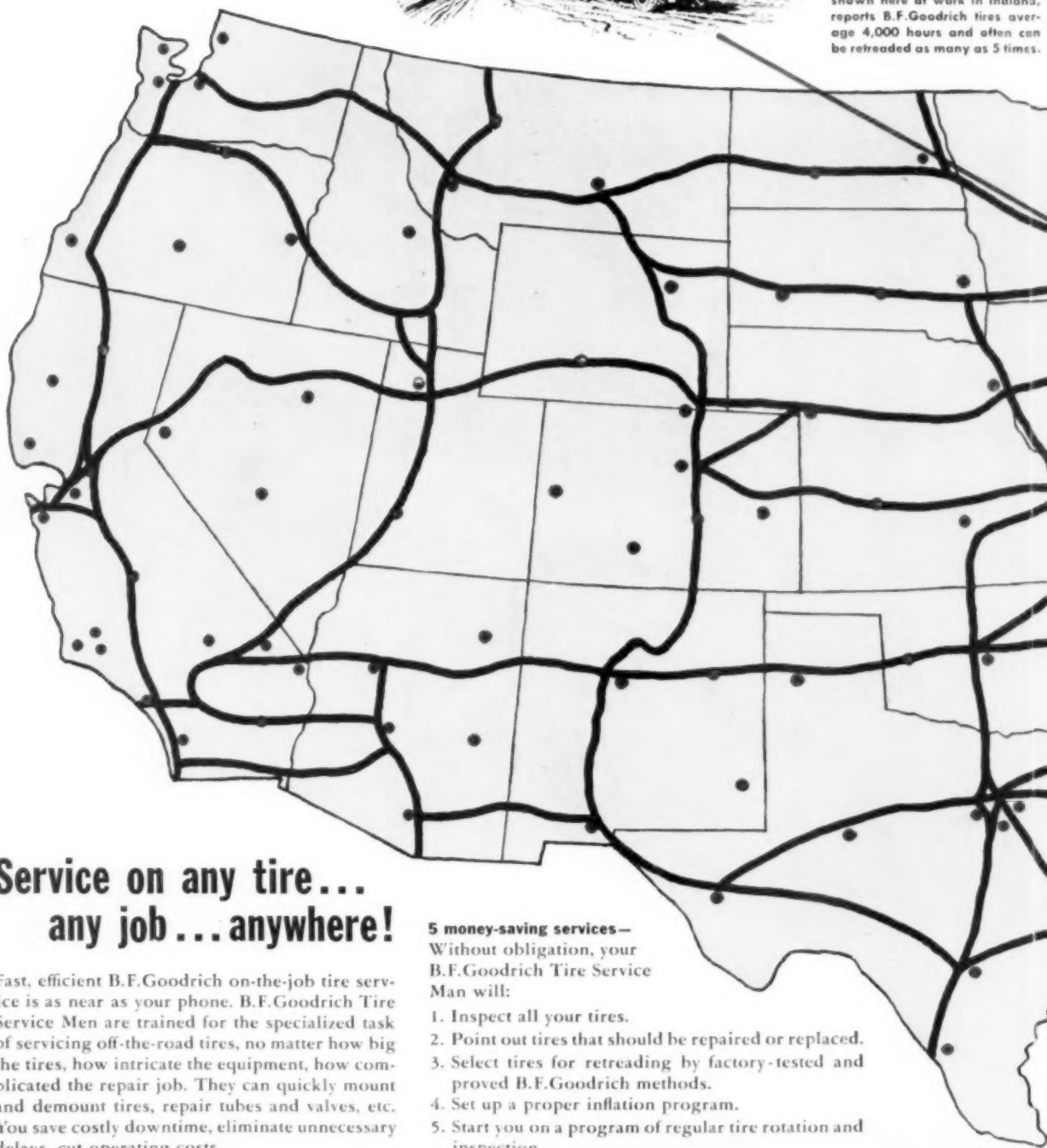
Turn the page and see how 6 contractors saved with B.F. Goodrich tires and tire service!

... for more details circle 233 on enclosed return postal card

# Wherever you go **B.F. Goodrich** tire



S. J. GROVES & SONS CO., shown here at work in Indiana, reports B.F. Goodrich tires average 4,000 hours and often can be retreaded as many as 5 times.



## Service on any tire... any job...anywhere!

Fast, efficient B.F. Goodrich on-the-job tire service is as near as your phone. B.F. Goodrich Tire Service Men are trained for the specialized task of servicing off-the-road tires, no matter how big the tires, how intricate the equipment, how complicated the repair job. They can quickly mount and demount tires, repair tubes and valves, etc. You save costly downtime, eliminate unnecessary delays, cut operating costs.

**5 money-saving services—**  
Without obligation, your  
B.F. Goodrich Tire Service  
Man will:

1. Inspect all your tires.
2. Point out tires that should be repaired or replaced.
3. Select tires for retreading by factory-tested and proved B.F. Goodrich methods.
4. Set up a proper inflation program.
5. Start you on a program of regular tire rotation and inspection.

## **B.F. Goodrich** *off-the-road tires*

# e service keeps you on the go!

- The red dots represent B.F. Goodrich dealers who offer on-the-job tire service. Whether you're at work on the \$50-billion, 41,000-mile Interstate Highway System (black lines), or on any other construction, mine or quarry project, you can be sure of expert, efficient tire service on the job from your local B.F. Goodrich dealer.

ONS CO.,  
n Indiana,  
tires aver-  
often can  
as 5 times.



**O'CONNOR CONSTRUCTION CO.** is turning an old road into a 4-lane highway in central Illinois, reports B.F. Goodrich tires give 6,000 hours of service, including retreads.



**JERNIGAN TRUCKING CO.** equipment hauls stone for bridge approaches near Augusta, Ga. The company reports B. F. Goodrich FLEX-RITE NYLON tires have gone over 50,000 miles—an all-time record on this operation.



**FULLY EQUIPPED SERVICEMOBILES**—B.F. Goodrich Servicemobiles are equipped with hydraulic crane, pneumatic wrenches, bead jacks and all of the latest power tools and devices for speedy, efficient tire service on the job.

# How 6 contractors save with B.F. Goodrich tires



**IN ILLINOIS**—CKG Associates is at work on the Northern Illinois Toll Road near Elgin. The company operates 115 vehicles, uses B.F. Goodrich FLEX-RITE NYLON Rock Service, Tractor Grader, Earth Mover Traction, Rock Logger and All-Purpose tires. Excellent on-the-job service is one reason they prefer B.F. Goodrich tires.



**IN WASHINGTON**—"We switched to B.F. Goodrich FLEX-RITE NYLON Rock Logger tires 3 years ago," writes Richard M. Ward, Truck Supt. of F. R. Hewett Co., contractors of Spokane, Wash. "They have given us up to 50% more service than the tires we used previously. We have been able to retread them too."



**IN NORTH DAKOTA**—This scraper is one of 75 units operated by Northern Improvement Co. on road projects in the Dakotas, Minnesota and Montana. The scraper weighs 35 tons loaded, works 60 to 72 hours a week. The B.F. Goodrich FLEX-RITE NYLON Super Traction tires give 5,000 hours' service before retreading!



**IN FLORIDA**—The Ralph E. Mills Company builds roads all over the world. Here the job is grading and filling on the Florida State Turnpike. The company reports B.F. Goodrich FLEX-RITE NYLON Super Traction tires work as many as 3,000 hours, thanks in part to the on-the-job service the local BFG dealer gives.



**IN MICHIGAN**—Julius Porath & Son Co. builds roads in southeastern Michigan, uses 105 pieces of equipment including trucks, cranes, dozers and graders. Because much work is in sand, Porath uses B.F. Goodrich FLEX-RITE NYLON 65" Special Earth Mover tires, reports they are "the best tires for this type of work."



**IN PENNSYLVANIA**—Gasparini Excavating Co., Inc., does highway and heavy construction work—here on the Pennsylvania Turnpike. The company finds "B.F. Goodrich FLEX-RITE NYLON tires give over 4 years' service. They minimize breakdowns and impact breaks, give maximum contract performance in the shortest contract period."



## Smileage!



for...  
**PROFITABLE**  
Performance!



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**ROLL-O-MATIC**

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**MOTOR GRADERS & ROLLERS**

ROADS AND STREETS, May, 1958

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# Now you can handle **BIG** jobs with a low-cost Series 50 H or 60 H Chevrolet!



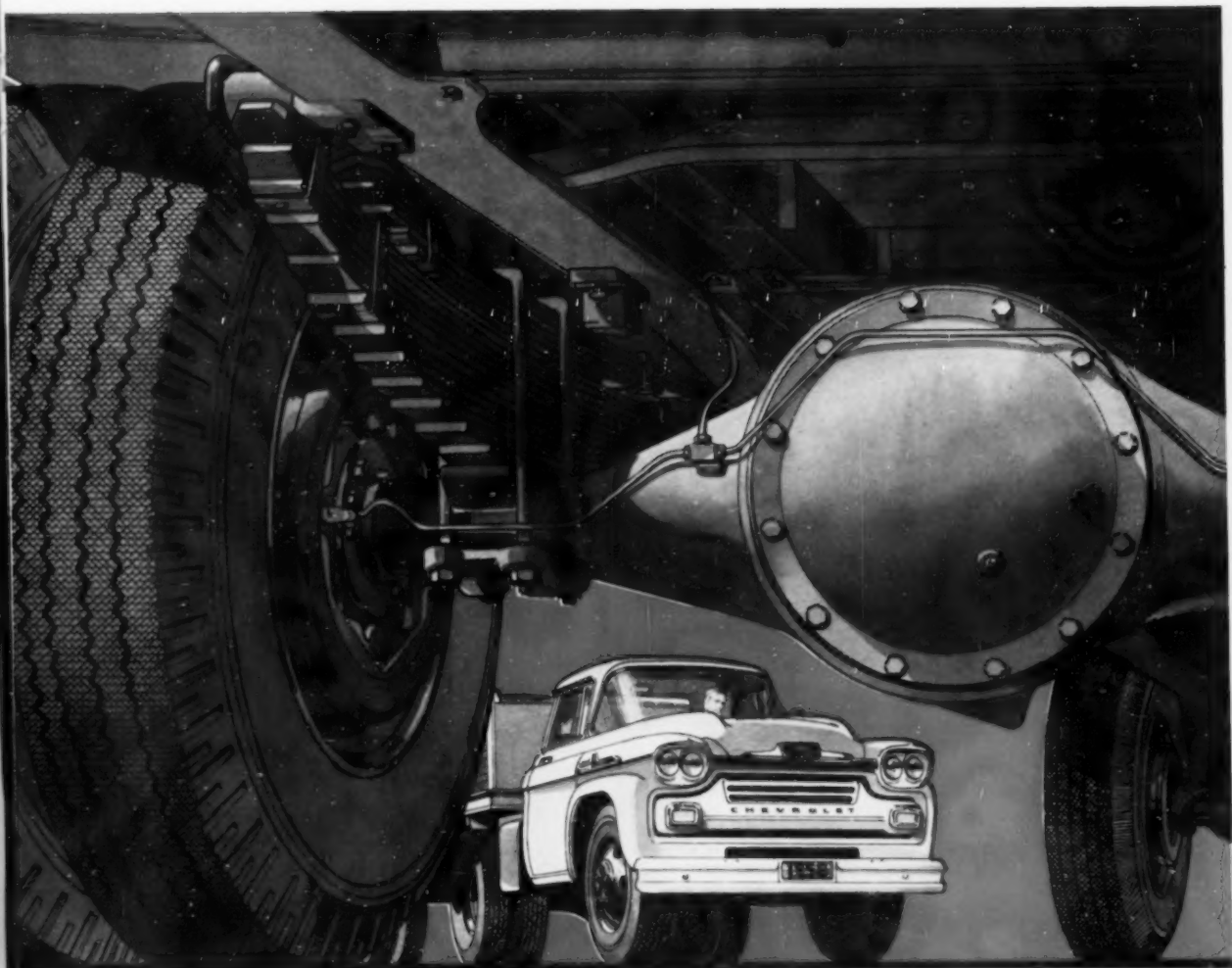
Here's an opportunity to save hundreds of dollars on the next big truck you buy! Extra equipment is now available to broaden the application of economical Series 50 and 60 models. They're ready to do big jobs with G.V.W.'s up to 21,000 lbs. ... and you pocket the big price difference!



Chevrolet's new Series 50 and 60 "H" models are equipped to work like trucks that cost much more . . . to do many jobs that used to call for bigger and more expensive trucks. *They're priced hundreds of dollars lower than other heavy-weight haulers*, yet they're ready to take on tasks requiring up to 21,000 lbs. G.V.W.—thanks to these husky heavyweight components:

- 16,000-lb.-capacity single- or two-speed Eaton rear axles.\*
- Big-truck brakes—9½-inch Hydrovac power brakes\* or Air-Hydraulic brakes.\*
- 4-speed Synchro-Mesh transmission with hard-pulling 7.06 to 1 low gear ratio or New Process 5-speed\* or 6-speed Powermatic transmissions.\*
- Tough long-leaf front springs that go up to

## CHEVROLET TASK·FORCE



2,900 lbs. capacity\* at each wheel; rear springs with up to 9,100 lbs. capacity.\*

- Heavyweight V8's—modern power from 160-h.p. Heavy-Duty Taskmaster V8 or 175-h.p. Heavy-Duty Super Taskmaster V8.\*

Tough heavy-duty components such as these broaden the application of Chevrolet's Series 50 and 60 trucks. The new "H" models are ideal for many mammoth hauling jobs, such as car haulaways, or for pulling grain semi-trailers, or contractors' dump bodies, and many more. They're true big-tonnage haulers in everything but price, and, chances are, there's one to suit your job. See your Chevrolet dealer soon; see how you can save hundreds of dollars on the next big truck you buy! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

*\*Extra-cost heavy-duty options.*

# TRUCKS

ROADS AND STREETS, May, 1958



## An all-new high-style pickup by Chevrolet!

It's the smooth-lined new *Fleetside*—as handsome a pickup as ever graced a hauler's business! With the latest in styling, it's a standout on any street, and you get extra utility, too. The *big* body—a full 6 feet wide and up to 98 inches long—enables you to haul many additional cubic feet of payload.

. . . for more details circle 271 on enclosed return postal card



## How B & B Construction Company licked high tractor repair bills

B & B Construction Co., Irwinton, Ga., studied its tractor maintenance costs last year, and decided to do something about them. Repair bills on the firm's 5 crawlers had totaled approximately \$30,000 in 1 year's operation in sand, clay and water. According to owner A. S. Boone, "That was *too much!*"

The firm was familiar with the low upkeep of LeTourneau-Westinghouse equipment. Its 2 Model D Tournapull® scrapers, with a total of 5,000 hours, had cost only \$450 to service... so it bought 2 rubber-tired Tournatractors®. "That decision *really* saved us money!" Boone

says today. Here's how the change of equipment paid off:

### **2 tractors replace 4... yet increase production**

The 2 Tournatractors replaced 4 crawlers — yet are actually *increasing* production. Boone says: "We can do 2 to 3 times as much work with Tournatractor." Superintendent Jim Vaughn agrees, adds: "It can push two scrapers in the same time a crawler is pushing one."

### **Downtime cut by ¾**

Tournatractor downtime has been only 10 days in a year... compared

to 30 a year per crawler. Boone also says Tournatractor lube time is only 5 minutes, far less than a crawler.

As a "clincher", B & B records show this fact: at the same time it bought its 2 Tournatractors, the firm purchased 4 LeTourneau-Westinghouse C Tournapulls with 18-yd. Fullpak® scrapers and one new crawler tractor. *The maintenance cost of all 6 L-W machines combined has been approximately \$4,500 or average of \$750 per machine, that of the one crawler approximately \$2,200.*

Look closely at your maintenance costs, then study Tournatractor. Write for full details.



## B & B rubber-tired units complete 2½ mile cycles in less than 10 minutes

B & B recently leveled a building site and did road construction for American Industrial Clays, Inc., near Sandersville, Ga. For this 220,000 cu. yd. project, the firm brought in a Tournatractor, 2 C Fullpaks, and another L-W product, an Adams\* 512 motor grader.

Tournatractor push-loaded the Fullpaks to 13 and 14-yd. payloads of sandy clay in 38 sec. over 90°. Material was then hauled over 1¼ mi. to fill a slough pit. The haul road included steep grades and sharp turns, but was kept in good shape by the Adams. The 13,960'

cycles were completed in an average of 9.42 min. each. That's a speed, for the entire load-haul-spread-and-return cycles of 17 mph.

### Beats production of neighboring contractor 5-to-1

Fast production times are no novelty to B & B since it acquired its new L-W machines. On a previous job, the firm moved 128,445 cu. yds. in 5 weeks... after a nearby contractor had been able to move only 30,000 yds. in 6 weeks on the same type of job.



"No matter what you want in a tractor... speed, power, maneuverability... Tournatractor's got it all!" says B & B Construction Co. Supt. Jim Vaughn. Firm replaced 4 crawlers with 2 Tournatractors, has boosted total production while cutting maintenance costs.

C Tournapull with 18-yd. Fullpak scraper barrels along haul road on leveling job near Sandersville, Ga. Machine's ability to travel 29.9 mph helped B & B average 17 mph for complete cycles.

\*Trademark CTCF-1574-DCJ-2



... for more details circle 297 on enclosed return postal card



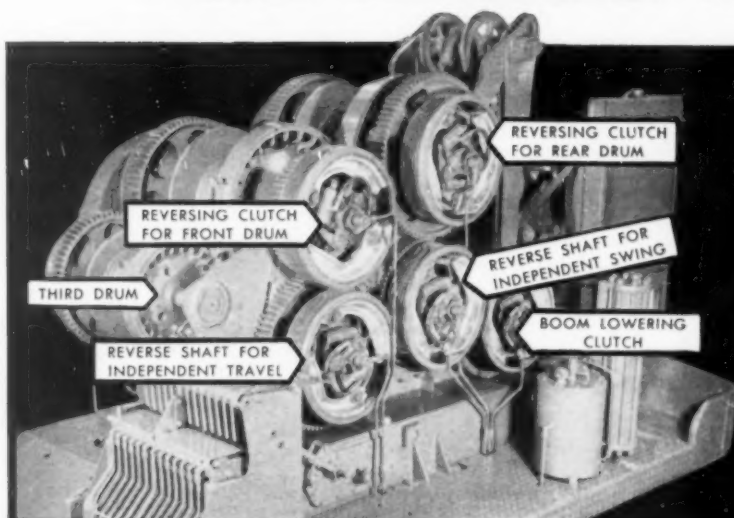
**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Only with Link-Belt Speeder **Full-Function** design...

# all these features



## Exclusive Full-Function Design

Each of these functions, as keyed at left, operates with its own power train and therefore independently of all other operations. This design permits more versatility . . . assures longer life.

### STANDARD FEATURES

- Power hydraulic controls
- Hydraulic power steering
- Independent rapid boomhoist
- Fully interchangeable, self-adjusting clutches
- Two-speed travel in either direction through gear reduction

LS-98	OTHER 1-YD. MACHINES*			
	RIG A	RIG B	RIG C	RIG D

### OPTIONAL FEATURES

- Reversing clutches for one drum
- Reversing clutches for both main drums
- Boom lowering clutch
- Third drum without restricting any other function
- Independent swing and travel without restricting any other function
- Torque converters

LS-98	OTHER 1-YD. MACHINES*			
	RIG A	RIG B	RIG C	RIG D

\* Ask your Link-Belt Speeder distributor for the facts behind this comparison.

Get a profit bonus with these standard features . . .  
tailor the machine to the job with these optional features

Revolutionary *Full-Function* design provides a separate power train for each machine function.

That's why you can have and use all these 11 major features on the same machine in the 1/2, 3/4 and 1 yard sizes—without restricting other operations.

Practically double power train life. *Full-Function* design spreads wear over more clutches, shafts, gears and bearings. Only the power trains in use are under load!

But this is only one of the many Link-Belt Speeder advantages. You also get—

- Greater usable horsepower
- Speed-o-Matic—proven power hydraulic controls
- Bonus crane capacity working with long booms at extended radii

For complete details, contact your distributor. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa, for Book No. 2553.

14,777-A

## LINK-BELT SPEEDER



18 crawler models



6 truck-crane models

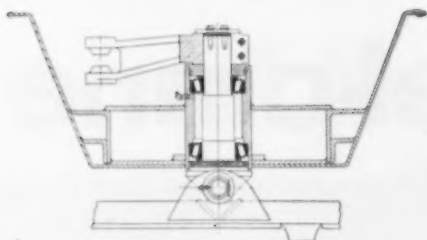


4 self-propelled models

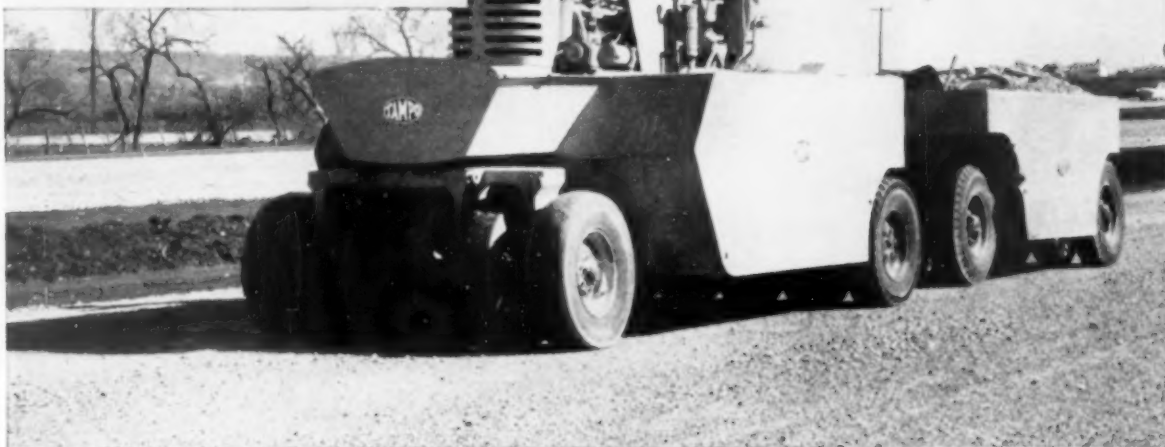
It's time to compare . . . with a Link-Belt Speeder

# on one shovel-crane





How **TAMPO MANUFACTURING COMPANY** mounts front bolster king pin assembly of its Model SP-11S Roller on Timken bearings to insure easy steering under heavy, varying loads.



## Steers 11 tons one-handed with **TIMKEN®** bearings to absorb the heavy, varying loads of uneven ground

**I**T takes more than power steering to keep this new 11-ton Tambo Model SP-11S Roller in a straight line on uneven surfaces. To keep the front bolster assembly rigid, allow easy, sure steering under heavy and varying wheel loads, Tambo engineers mount it on Timken® tapered roller bearings. And they use Timken bearings at 18 other vital points on wheels and axles.

Tambo and other leading construction equipment manufacturers use Timken bearings because:

**LOADS NO PROBLEM.** Timken bearings' tapered construction lets them take all combinations of radial and thrust loads. And full-line contact

between rollers and races gives Timken bearings *extra* load-carrying capacity.

**REDUCE MAINTENANCE.** Because they hold shafts concentric with housings, Timken bearings make closures more effective. Dirt stays out, lubricant in.

**PROVIDE LONGER LIFE.** Geometrically designed to roll true and precision-made to live up to their design, Timken bearings practically eliminate friction. They *roll* the load. Bearings and related parts last longer.

To further insure bearing quality, we make our own fine alloy steel. No other American bearing maker

does. To get all these advantages, specify bearings trade-marked "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".



*This symbol on a product means its bearings are the best.*



# TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

## TAPERED ROLLER BEARINGS ROLL THE LOAD

... for more details circle 330 on enclosed return postal card



## ROADS AND STREETS

Sixty-Six Years of Editorial Leadership

# Washington News Letter



Exclusive - By Duane L. Cronk, Director, Highway Information Services

May 10, 1958

There has been hardly a pause of relaxation in Washington since President Eisenhower reluctantly signed the 1958 Federal-Aid Highway Act last month. The Department of Commerce apportioned \$600 million in federal aid among the state highway departments the next day, and officials came quickly to the realization that the heat is on to get construction under way in haste. More than one Congressman had expressed reservations about the value of such public works to stem unemployment and they will be watching the big road program with a critical eye.

Last month, we reported the bill as it had passed the Senate. The Act that emerged from conference with the House and was signed by the President is not substantially different. However, these major provisions should be noted:

- The final version authorizes almost \$3.3 billion in new federal money (above that authorized in the 1956 Act) for fiscal years 1959 (beginning July 1 this year), 1960 and 1961.

- The new money for fiscal 1959 - \$611 million - is already available. It includes \$200 million more for the Interstate System; \$400 million for anti-recession projects on the ABC systems; and \$11 million more for federal public domain roads. This brings the total authorization for fiscal 1959 (under both the previous 1956 Act and the new 1958 Act) to nearly \$3.6 billion. And state matching will boost this to a total federal-aid program of \$4.9 billion.

- As for fiscal years 1960 and 1961, the new Act authorizes more than \$2.6 billion of new federal aid for all systems, bringing the total now authorized for those two years to about \$7 billion. When the states have put up their required matching money, the total federal-aid program on all systems for these two fiscal years will amount to about \$9.4 billion.

\* \* \*

This, in brief, is the federal-aid highway market spelled out by the new legislation. Even though the huge authorizations are seemingly for years well in the future, the law makes possible early apportionments distribution to the state highway departments. For example, all the fiscal 1959 funds are now ready to be picked up, and sometime early this summer the Department of Commerce will release the \$3.4-billion 1960 apportionment. States that are in position to do so can work several years in advance.

Reactions to the measure have been varied. ARBA's Executive Vice President Louis Prentiss was pleased that the bill had hurdled a number of obstacles and that it indicated the desire of most Congressmen to accelerate roadbuilding. He

(continued on next page)

pointed out, however, that no long-term financing foundation has yet been established to carry the full cost of the National Interstate System or to complete it within the original 13-year schedule.

The Administration, of course, was dismayed to see a \$400-million anti-recession fund set up in the Act. Many highway leaders here are also leery of the boosting of the federal contribution on the ABC systems from the traditional 1 to 1 basis to a 2 to 1 formula for this part of the program. There are mixed sentiments on the bill-board regulation measure and considerable feeling on both sides of the utilities reimbursement question.

And the problem of whether or not to reimburse states for toll roads and free roads, built by their own financing but now designated as part of the Interstate System, was sidestepped. Congressmen and Senators pushing aggressively for a decision were promised consideration in separate legislation. Such bills are now pending, after some very heated hearings in the House.

\* \* \*

The BPR has analyzed 1957 federal-aid road construction contract awards and found the results enlightening. Among other things, the review reveals:

- That the average contract was only \$325,000 and the median contract was only \$100,000.
- That one-third of all highway construction bids were for contracts for amounts less than \$50,000; and nearly three-quarters were for less than \$250,000.
- That contracts under \$1 million in size, although they accounted for half the money involved in the program, represented 93% of the total number of contract awards.

This is convincing evidence, the Bureau feels that the National Highway Program is geared to allow the greatest participation by small business. The 7,386 contracts reviewed ranged from one for \$1,800 for a reinforced concrete box culvert in Kansas to one for \$15,547,000 for a New York City expressway.

Meanwhile, bid prices have taken a dip. The index of average bid prices decreased 2% during the first quarter of calendar '58. Excavation bids fell off the greatest - 5.4% - and structural steel followed with a decline of 4.1%.

\* \* \*

The construction industry turned out in strength to support continuation of the National Airport Program. This federal-aid endeavor has struggled along on a stop-and-go manner for several years and the current Administration has quite frankly urged its discontinuance.

The 1955 Airport Act authorized \$63 million a year for fiscal 1956, 1957, 1958, and 1959 - to be matched by local communities on a 50-50 basis. The Senate Committee on Interstate and Foreign Commerce is currently investigating the merits of a new bill which would increase these sums to \$100 million annually for the next four years, besides kicking in \$75 million additional for fiscal 1959 as an emergency job-producing stimulus. These federal grants, with local matching money, would thus produce a \$950-million construction program.

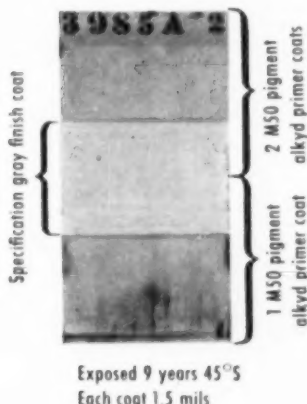
The Administration is opposed. It disowns the need for national responsibility in this area just now and wants the local governments to tackle this work on its own. Both the American Road Builders Association and the Associated General Contractors of America were granted opportunity to speak out for the program during the hearings last month, and both advocated continuing participation by the federal government.

Area shaded from sun by wooden panel holder

**After 9 years exposure, fading has barely begun to show in this 3-mil M50 primer coat.** Same type paint made with standard rust inhibiting pigment chalked and showed rusting in less than half this time.

Unshaded area

How test paints shown at right were applied



**1.5 mil M50 primer coat is still in place, still actively resisting corrosion after 9 years.** Same type paint made with conventional pigment almost completely disappeared in the same period.

## **Proof M50 pigment Defense in Depth paints deliver lasting weather resistance**

Never before such durable metal protection for highway bridges, guard posts, railings, sign posts. And never before such attractive color choices.



Here you see how typical M50 pigment primer coats weather 9 years exposure. The advantages of weather resistance like this in the primer coat of an anti-corrosive paint system cannot be overstressed. Long after weather has worked its way through intermediate and finish coats, primers made with M50\* basic lead silico chromate pigment still provide excellent weather protection. Rust inhibiting action in the film continues unchecked. Even breaks in top coats trace-

able to damage or painting mishaps do little harm.

The excellent chalk resistance shown by M50\* pigment primers also pays off handsomely. When steel erection is delayed, re-preparation of the steel is rarely needed. On-the-job spot priming is sharply reduced.

On the next page, see how typical M50 finish paints perform in severe exposure tests.



\*Registered trademark of

**National Lead Company**

General Offices: 111 Broadway, New York 6, N.Y.



**No visible splotching!**

Test angles above show how a typical M50 pigment finish paint applied directly to steel (no primer or intermediate) withstands 4 years exposure in indus-

trial atmospheres. Left, M50 pigment finish applied on rusted surface with retained mill scale. Right, same paint applied on clean, sand-blasted surface.

4.5  
mils

Finish over  
primer and  
intermediate

3.0  
mils

Finish over  
primer alone

**No visible chalking!**

This test angle demonstrates the excellent resistance to chalking or fading shown by M50 pigment Defense in Depth paints. Paint has been exposed 2 years,

45°S in normal atmosphere. The insolubility and stability of M50 fused lead chromate pigment contributes substantially to this performance.

## Here are two performance plusses you can expect from M50 anti-corrosive finish paints exposed to weather

With M50\* pigment Defense in Depth paints, lasting weather resistance is obtained in all coats . . . not just intermediates and finishes. This is clearly brought out by exposure tests such as the ones shown on this and the preceding page.

Along with lasting 3-deep weather resistance, M50 pigment anti-corrosive paint systems give you 3-deep rust inhibition and 3-deep color choice. Never before has it been possible to produce specification anti-corrosive paints with comparable performances that could be sold at current market levels.

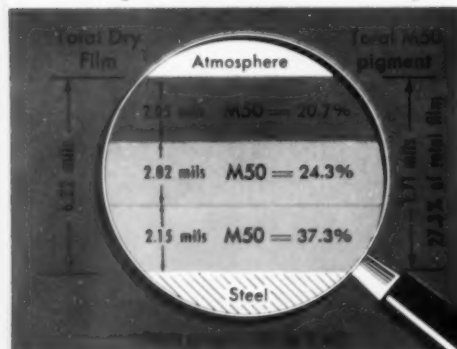
Now, with National Lead's M50 pigment, most paint makers can make such paints.

National Lead is prepared to help your supplier formulate M50 pigment paints and also: (1) show you M50 pigment paint exposure test panels at its Sayville, L. I. Test Station; (2) send you a 24-page descriptive brochure, "Defense in Depth." (Mail coupon below); (3) provide technical aid in test applications; (4) help you develop suitable specifications for paints containing M50 pigment.

For M50 pigment paints themselves, contact your regular suppliers.

\*National Lead Company trademark for a basic lead silico chromate pigment

### Why M50 Defense in Depth paints give you metal protection beyond all former concepts



In every coat . . . rust inhibition! Fused lead chromate is noted for rust-inhibition. The M50 pigment particle structure permits paint makers to include large proportions of lead chromate in all coats of anti-corrosive systems.

**3985A-2**

2 M50 pigment alkyd primer coats  
Exposed 9 yrs 45°S  
Each coat 1.5 mils dry film

M50 pigment finish  
put on rusty steel  
Exposed 4 yrs 45°S  
in industrial atmosphere

In every coat . . . weather resistance! M50 pigment is insoluble in water and has the excellent tint retention properties of fused lead chromate. Unlike other rust inhibitors, it actually boosts weather resistance of paints.

**P1523**

3.0 mils  
1.5 mils

Name your  
own tint



In every coat . . . your choice of colors! M50 pigment gets along well with most tinting pigments, permits paint makers a wide range of colors . . . not only in intermediates and finishes but in primer coats as well. Colors stay true.



**M50  
Defense  
in  
Depth**

**National Lead Company,  
111 Broadway, New York 6, N. Y.**

Gentlemen: Please send me your 24-page brochure, "Defense in Depth." Include color card of the six M50 pigment paints you recommend for steel highway structures.



Name \_\_\_\_\_ Title \_\_\_\_\_  
Firm or Dept. \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



# ROGERS



## A New Symbol in TRAILERDOM

### Identifying the

This 25 ton Top Value Trailer is well named. Never during our many years of specialized experience has there been available a trailer of comparable value —

**ROGERS** Top Value Trailer

- TOP VALUE** in low first cost —
- TOP VALUE** in embodiment of basic requirements —
- TOP VALUE** in wide adaptability to hauling needs —
- TOP VALUE** in lightness compared with load capacity (only 9,000 pounds)
- TOP VALUE** in ease of hauling — and maneuverability —
- TOP VALUE** in fast, safe braking —
- TOP VALUE** in returns on your investment —
- TOP VALUE** in general all 'round satisfaction.

#### Advanced Designing

based upon pioneering experience and volume production enable us to offer this Top Value Trailer at a most attractive price.

At least one unit should be added promptly to every heavy hauling fleet. Mail the coupon for complete information including price.

#### GET THE DESCRIPTIVE LITERATURE PROMPTLY

Fill in, detach and mail this coupon to the Rogers Distributor in your vicinity or to us.

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Attention of \_\_\_\_\_

**ROGERS BROS. CORPORATION**  
Albion, Penna. EXPORT OFFICE: 50 Church St. New York 7, N. Y., U. S. A.  
Cable Address: BROGSIRES

**25 TON CAPACITY**  
to haul a large percentage of loads

**DESIGNED FOR LIGHTNESS**  
without sacrifice of strength.  
(Only 9,000 pounds)

**ALLOY STEEL MAIN BEAMS**  
from "tail" to and including gooseneck

**EMBODIES ALL BASIC FEATURES**

**VOLUME PRODUCED**  
to insure a low price

**BEAVER TAIL END**  
for easier loading and lengthened load capacity

**LONG FLAT GOOSENECK**  
carries bulldozer blades, dippers, etc.

**AMPLE SPACE IN GOOSENECK**  
to carry jacks, blocking, etc.

Whether you have it



...or not



# YOU ARE PAYING FOR 2-WAY RADIO

The cost of *not* having 2-way radio is actually taking dollars out of your pocket every day . . . more money than it would cost to own your own Motorola 2-way radio system. Here's why!

Drivers radio in direct from their vehicles—*save* the delay, inconvenience and cost of telephoning. With radio contact, you can move your drivers *directly* from job to job—as they *save* miles, they also *save valuable time*. There's less back-tracking, less "dead-heading"—more efficient use of drivers and vehicles.

AND HERE'S PROOF. Even if your truck costs are as low as \$4.00 an hour (\$2.00 for driver and \$2.00 for truck)—saving as little as *3 minutes* an hour will more than pay for your Motorola radio. Figured on a mileage basis (at a minimum cost of 7c per mile)—saving as little as *10 miles* a day for each truck will pay for more than half of the cost of your Motorola 2-way radio system.

**Get the full money saving, money making story on Motorola 2-way radio . . . complete product line—engineering service—installation—maintenance—lease/finance plans, for every need.**



## **MOTOROLA** 2-WAY RADIO

Motorola Communications & Electronics, Inc. • A Subsidiary of Motorola, Inc. • 4501 W. Augusta Boulevard, Chicago 51, Illinois

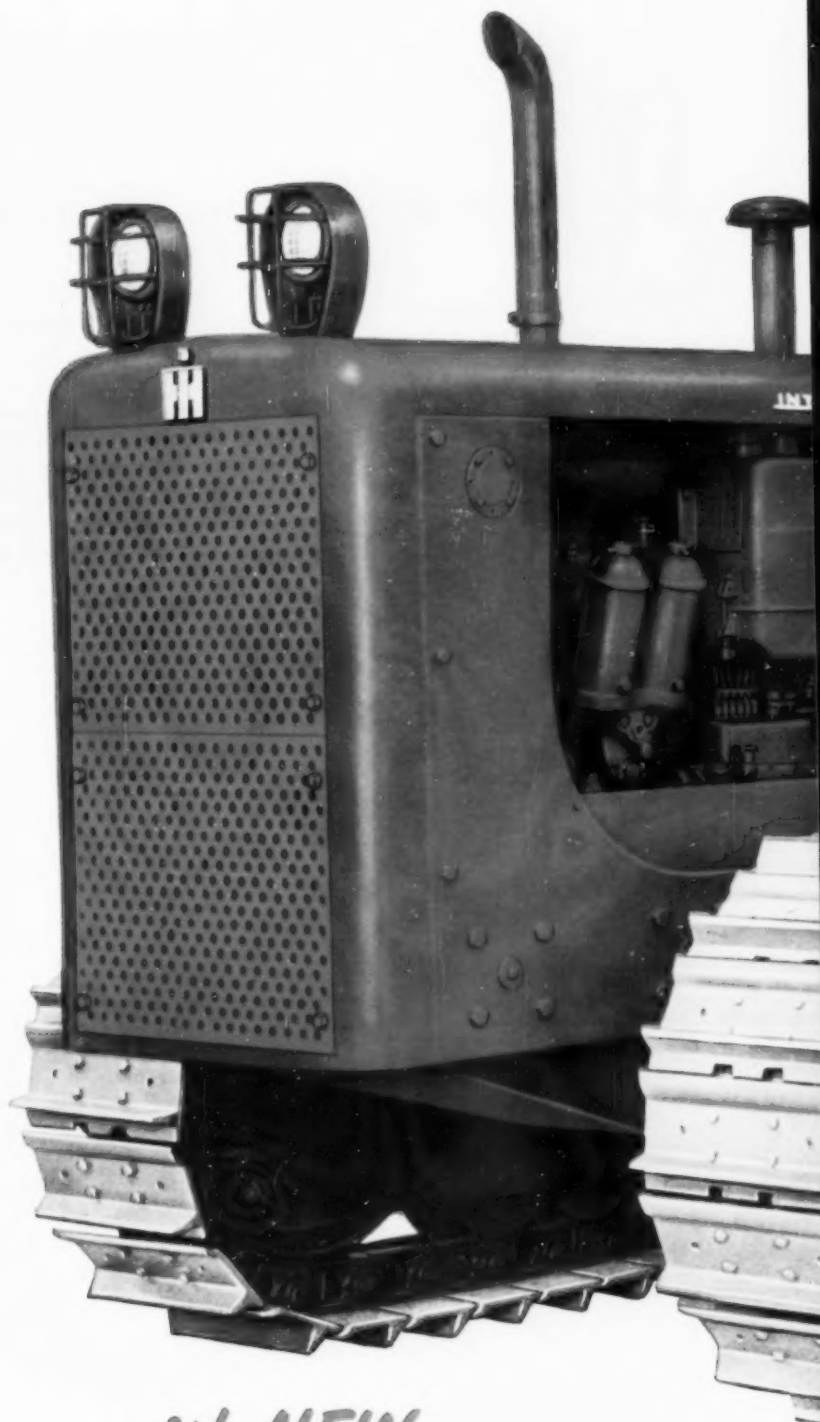
... for more details circle 302 on enclosed return postal card

# NEW TD-20

NEW  
TD-20

NEW

TD-20



*...with NEW  
yardage-boosting control*

... for more details circle 284 on enclosed return postal card  
**ROADS AND STREETS, May, 1958**

# NEW 134 hp International

## ... SIX SPEEDS, FULL

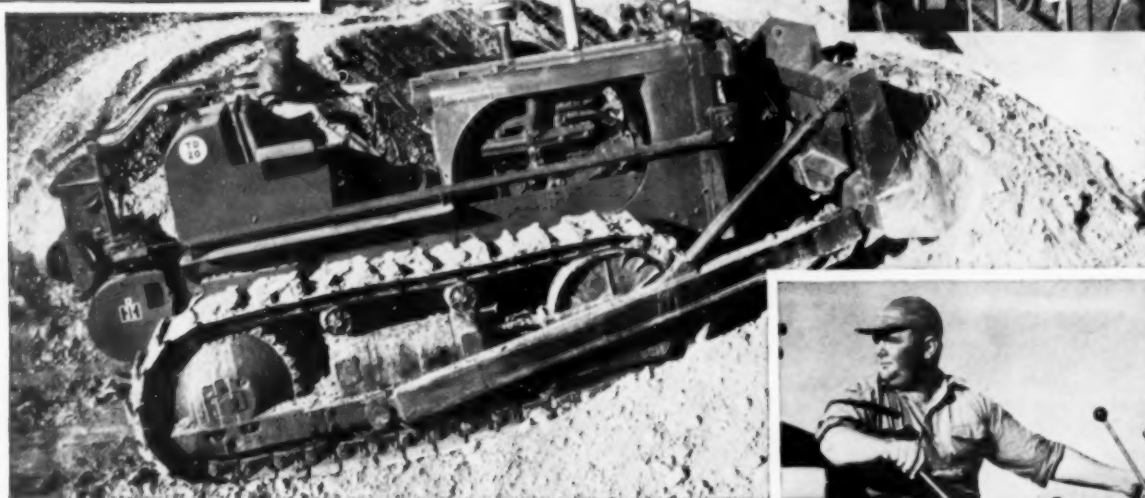
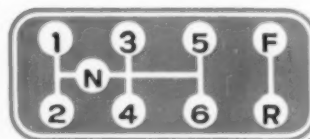
**EXCLUSIVE** TD-20 "Shuttle-Bar" shifting, forward! Just push the "Shuttle-Bar" forward. "Sweep" the gearshift lever into the "power" gear needed—for full blade, full speed dozing. And you're set for rolling the earth. You have a "heavy-work" gear choice for every need and condition. First gear forward (1.5 mph) gives you 27,500 pounds of push or pull at rated engine rpm!

**Shift through all six speed ranges with a "single stick"**

**Reverse direction in any speed range with "Shuttle-Bar"**

**NEW** in work-capacity, the International TD-20 gives you 134 net diesel engine hp. Revolutionary, it gives you exclusive "Shuttle-Bar" control teamed with an exclusive new 6-speed, "single stick" full reverse transmission! New TD-20 cycle-speeding "Shuttle-Bar" control gives you full and instant advantage of six speed ranges, forward or reverse. Never before has big crawler gear-changing and direction-changing been so fast, so easy, so profit-productive!

Look at the TD-20 control lever grouping! Lever "A" is for shifting gears through any of the six working speed ranges. Lever "B" is the exclusive "Shuttle-Bar" which operates forward-reverse direction-changing — providing six speed ranges forward; six, reverse! Inset view shows the gear shift pattern. Visualize how one quick arm sweep can shift the TD-20 from second to fifth gear and from forward to reverse!



**EXCLUSIVE** TD-20 "Shuttle-Bar" shifting, reverse! Hundreds of extra cubic yards moved daily can result from TD-20 cycle-speeding shuttling action! Sweep the gearshift lever into the desired travel gear

—pulling the "Shuttle-Bar" back with the same easy arm sweep. And you're set for highballing back for the next push, as fast as 8.4 mph!



... for more details circle 284 on enclosed return postal card



# TD-20 crawler tractor

## *REVERSE, "SHUTTLE-BAR" CONTROL*

**New handling ease and speed  
boost daily yardage with**

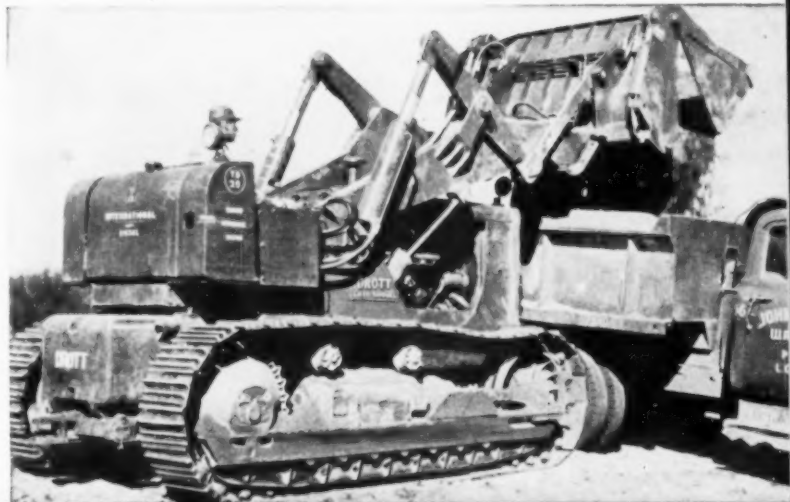
### **NEW INTERNATIONAL DROTT® TD-20 Four-in-One**

Using the International Drott TD-20 4-In-1 in bulldozer position for earthmoving or stockpiling usually calls for returning the unit to "next push" position. For speedy recovery, without "turn-around" or gear-shift delay, you simply use exclusive TD-20 "Shuttle-Bar" shifting! New 7-roller TD-20 4-In-1 track frame gives you a full 109" of track on the ground — for unsurpassed balance and stability.

From the excavation in first or second gear with a 4-ton load of dirt, a TD-20 4-In-1 can climb and dump —and be backing down the ramp for a "refill," faster than any other big loader you ever saw work. Fast dumping and fast "Shuttle-Bar" shifting are the reasons why! For toughest digging, the new International Drott TD-20 4-In-1 gives you a tremendous 46,800 pounds of break-out force!

You can speed up the cycle remarkably — can clip minutes off every truck-load—add hundreds of cubic yards to daily loader capacity. You can do it wherever you can apply shuttle loading teamed with exclusive TD-20 "Shuttle-Bar" shifting! Note how this operator uses exclusive 4-In-1 clamshell bottom dumping—for fast action and positive clean-out of sticky materials! New full-flow hydraulic system filter protects precision hydraulic parts indefinitely.

... for more details circle 284 on enclosed return postal card



AND NOW, teamed with the NEW TD-20



## THE MIGHTY TD-24 gives you **175** Planet-Power steered drawbar horsepower!

Now, the mighty International TD-24 becomes the most powerful gear-drive crawler in its size class—with 175 full-capacity working drawbar horsepower.

Now, you get 41,130 pounds of Planet Power-controlled pull at rated rpm. Nothing else on tracks gives you this positive load control! You get full-measure, full-time live power on both tracks — to handle the same big loads on turns as on the straight-aways.

Increased horsepower is matched by new power train strength—a widened, strengthened sprocket drive

gear and pinion — for long life under tough working conditions.

**Watch the TD-24 perform** from the operator's seat and compare profit-production of the TD-24 to any other gear-drive, king-size crawler. See what a major part Planet Power steering has in increasing dozing, pushing, and pulling profits. See your International Construction Equipment Distributor for a new TD-20 or TD-24 demonstration!

Exclusive combination of foot decelerator for feather-touch contact—Hi-Lo power shift for a speed-away send-off—high reverse for super-fast return to the push-starting point—makes the 175 hp TD-24 unequalled as a pusher!



**International<sup>®</sup>  
Construction  
Equipment**

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

**A COMPLETE POWER PACKAGE:** Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

... for more details circle 287 on enclosed return postal card



Maintenance Tips from Dino, the Sinclair Dinosaur

## Rugged Oil for Rugged Duty

Tackling tough jobs and getting 'em done on time demands a lot from your equipment. Sinclair Super TENOL® Motor Oil will help keep your equipment working on the job longer — and more profitably for you.

This superior lubricant, a blend of high viscosity index base oils and selected additives, provides maximum protection against varnish, sludge, rust and acid corrosion. It guards your equipment against the rugged effects of high temperatures and continuous stop-and-go operation.

Refill now. There's a type of Sinclair TENOL Motor Oil to meet the requirements of your equipment. Contact your local Sinclair Representative for further information, or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Ave., New York 20, N. Y. *There's no obligation.*



**SINCLAIR**  
**SUPER**  
**TENOL®**

... for more details circle 320 on enclosed return postal card

## KOEHRING WORK CAPACITY *in action*



**Big sewer program ahead** — in practically all areas there has been a heavy increase in sewer construction to keep up with rapid population growth. A popular machine on this work is the Koehring 1-yard 405 hoe (above). It digs 22½ ft. deep, up to 43 in. wide over sidecutters.



**At a new power plant,** heavy machinery received careful treatment in the hands of Koehring 205 Cruiser®. This one-man-operated crane safely lifts up to 15 tons — has smooth, torque-converter drive, power-steering, 27½-foot turning radius, 30% gradability, 21.5 mph travel speed.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
		(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	30,000 lbs.	at 12-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	30,000 lbs.	at 10-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs.	at 15 ft. radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

Want more information?



See Koehring distributor.

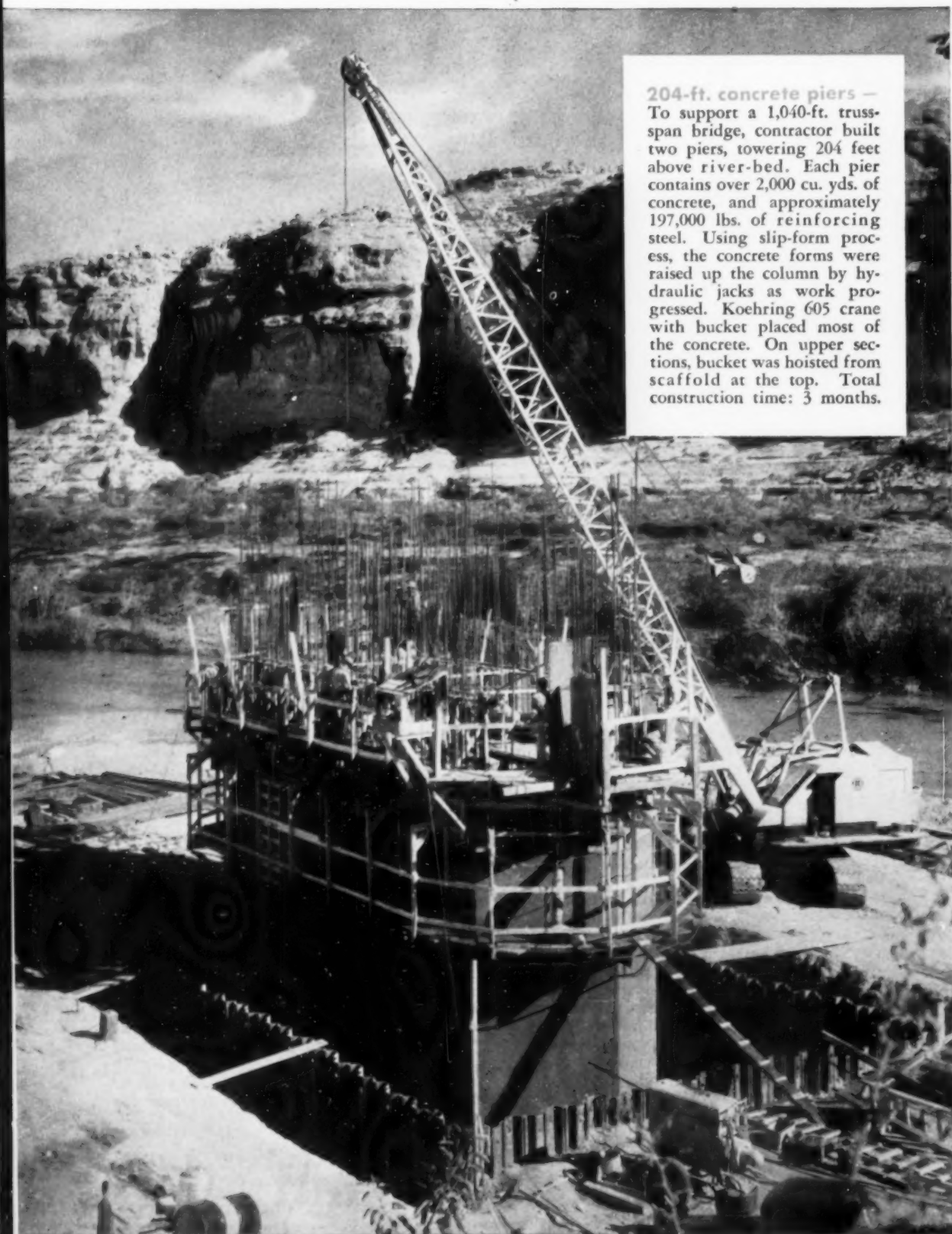


**Shopping center going in** — Development of large-acre tracts for suburban shopping centers has created considerable new business for grading contractors. A typical job is shown here. The dragline is a Koehring 305, which has a capacity of ¾ to 1-yard — (for more details see chart).

K729

EXCAVATORS • CRANES • DUMPTORS® • PAVERS • FINISHERS • CONSTRUCTION MIXERS • MUD-JACKS®





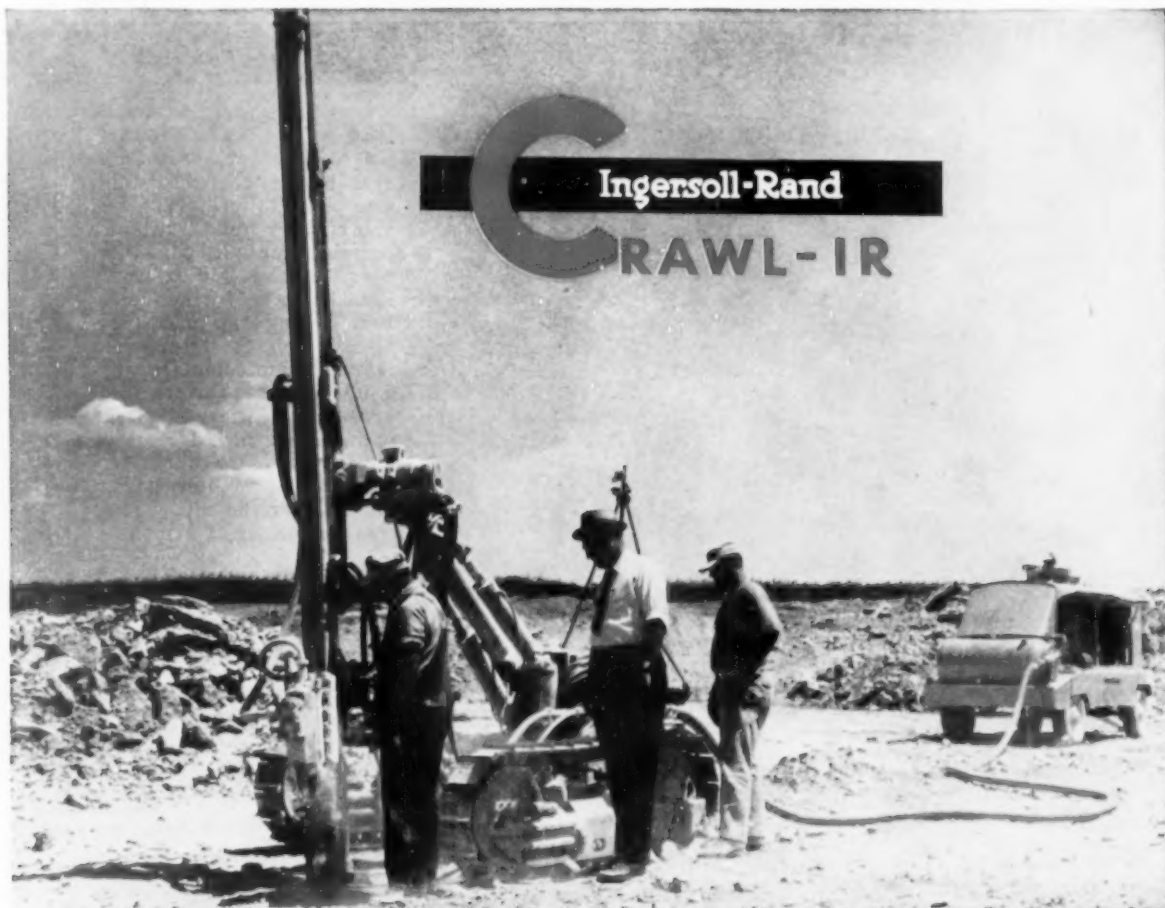
**204-ft. concrete piers —**

To support a 1,040-ft. truss-span bridge, contractor built two piers, towering 204 feet above river-bed. Each pier contains over 2,000 cu. yds. of concrete, and approximately 197,000 lbs. of reinforcing steel. Using slip-form process, the concrete forms were raised up the column by hydraulic jacks as work progressed. Koehring 605 crane with bucket placed most of the concrete. On upper sections, bucket was hoisted from scaffold at the top. Total construction time: 3 months.

**KOEHRING** DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

... for more details circle 290 on enclosed return postal card

**ROADS AND STREETS, May, 1958**



Ingersoll-Rand

CRAWL-IR

## "THE BEST WE EVER HAD"

says Francis Smalley, President  
D. R. Smalley & Sons, Inc.

"It's by far the fastest of its kind and that's just what we wanted. The best we ever had!" This is Francis Smalley's comment on the new CRAWL-IR shown above. It proved its performance on the rock work for relocation of highway U.S. 40 on the outskirts of Dayton, Ohio, under contract to D. R. Smalley & Sons, Inc., of Celina, Ohio.

The CRAWL-IR, with fully hydraulic controls, was used with I-R Carset bits and powered by a 600-cfm GYRO-FLO portable compressor—a team which easily broke all previous performance records for this type of work.

The Ingersoll-Rand CRAWL-IR is a *completely mechanized, self-propelled knee-action crawler*

drill at its rugged best. Five large, double-acting hydraulic cylinders move the feed tower to *any position* at the touch of a throttle. Reverse rotation of the powerful D-45 drill permits adding and removing coupled steels in a hurry. And the powerful, air-motor-driven crawlers permit the unit to tow its own compressor, even over rough terrain.

Time formerly spent in moving, setting up and steel handling is now turned into *drilling time*. With drill positioning fully mechanized, one-man operation is entirely feasible.

Ask your I-R man for complete information on the time-saving, money-saving features of the new CRAWL-IR.



Ingersoll-Rand

14-793

11 Broadway, New York 4, N.Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

... for more details circle 288 on enclosed return postal card

**A  
WORKHORSE RIG  
for  
WORKHORSE  
JOBS!**

**NORTHWEST**

**3/4 YD.  
MODEL  
25**



You don't have to take anybody's word—you don't have to believe the advertising on the Northwest Model 25's superiority. Go out and take a look at it in rock digging. Then compare it with *any other* ¾ yd. rig on the market.

It's the workhorse of the industry. These rigs load fast! Here is plenty of power combined with the Northwest Dual Independent Crowd that utilizes force other independent crowd shovels *waste*. No stutter—no restarts—no dipper juggling either in the bank or getting the load to the truck.

Compare it as a Pullshovel, Dragline or Crane. It's easy to convert. Booms are sturdier for workhorse digging and lifting. Swing Clutches are Uniform Pressure Clutches that eliminate the jerks and grabs that reduce output. The "Feather-Touch" Clutch Control gives ease of operation, without resorting to delicate mechanisms, valves, pumps and piping and at the same time retains the *feel of the load*.

There is a wide range of boom hoist equipment with which to meet your problem. There is flexibility in crawler dimensions. It is an answer to every problem where ¾ yd. capacity is the right size, and you have a full ¾ yd. machine that will handle work that smaller machines of the same rated capacity can't handle.

It's a workhorse!

**NORTHWEST ENGINEERING COMPANY**

1504 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

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525-11-2CG

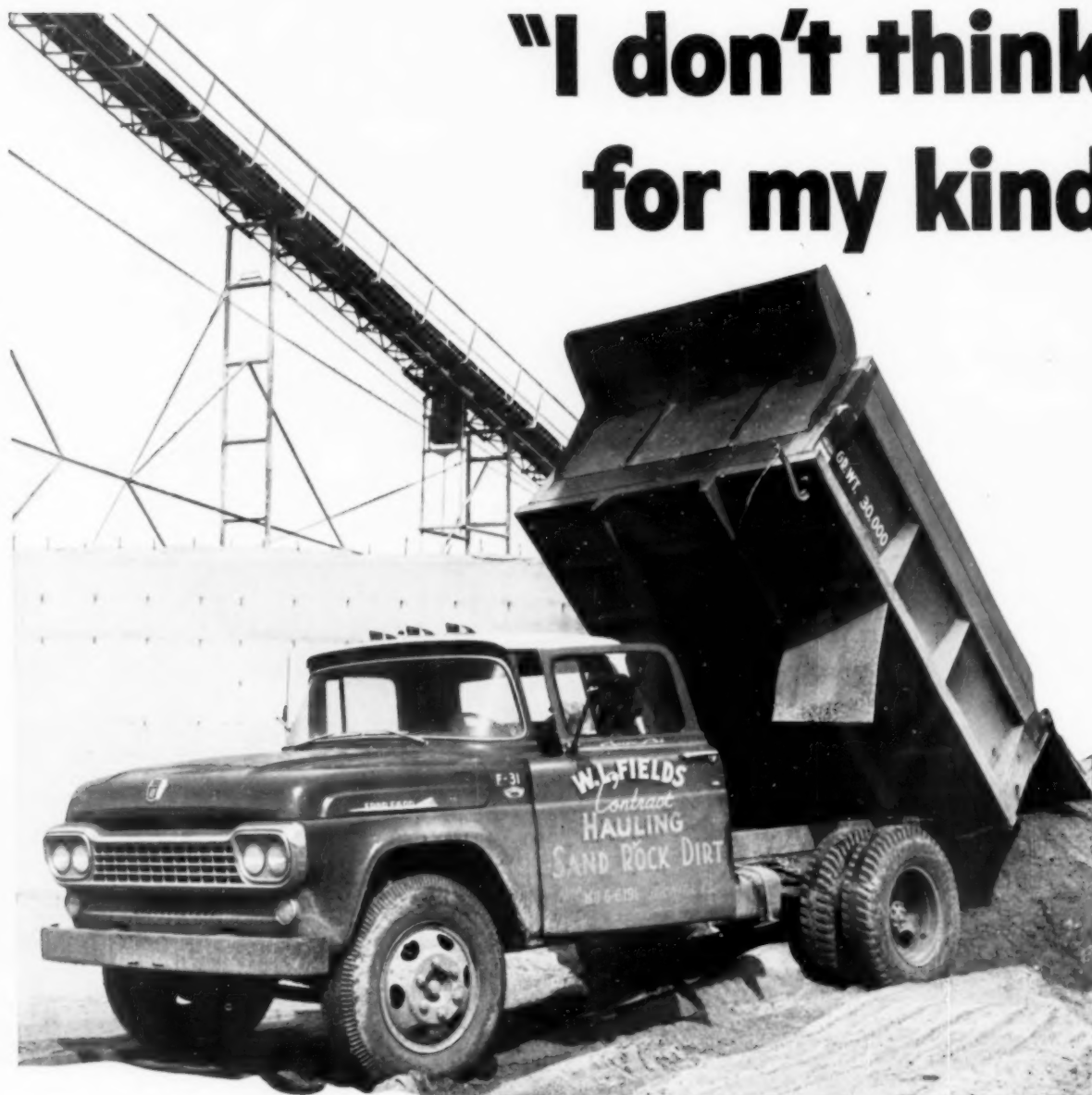


**THE GREATEST  
COMBINATION OF  
PROVED ADVANTAGES  
EVER BUILT INTO  
A SHOVEL, CRANE,  
DRAGLINE OR  
PULLSHOVEL**

**NORTHWEST**



# "I don't think for my kind



*Official registrations show . . .*

**AMERICAN  
BUSINESS BUYS  
MORE  
FORD TRUCKS  
THAN ANY  
OTHER MAKE!**



**FORD TANDEM** with 10-yard dump body and new F-600 with 5-yard dump . . . part of Mr. W. L. Fields's Ford Fleet.



# there's a tougher truck of work"

*says W. L. Fields*

*Contract Hauler, Wichita, Kansas*

***"And they cost less  
to operate than  
any trucks we've  
ever owned!"***

"Our 13 Fords are mostly two-ton dumps. They haul 6 yards of rock and sand, averaging about 7½ miles per gallon of gas. We get 6 mpg with Ford tandems carrying 14 tons. And they all really hold up. Ford's Heavy Duty V-8's are good for an average of 75,000 miles before an overhaul! We have a '55 Ford with over 150,000 miles on it, and I'll bet there's not another dump truck around here that's in such good shape."


***Whatever your business...  
there's a FORD truck for your  
special needs***

Official registrations for 1957 show that *American business buys more Ford trucks than any other make.* There are many reasons

for this popularity . . . many reasons for *you* to make your next truck a Ford!

Ford trucks are your best buy, too! Ford's initial costs are *low* and resale value is traditionally *high*. Modern Ford Styleside pickups, for instance, are the lowest priced with full cab-wide body . . . giving you 23% more loadspace than any traditional type pickup box.

Only Ford offers the economy



**FORD'S NEW 292 HD V-8**  
Brake Horsepower—187 @ 3800 rpm  
Bore—3.75 in. Stroke—3.30 in.  
Displacement—292 cu. in.

of Short Stroke power in all engines, Six or V-8. And Ford's Heavy Duty V-8's offer new, advanced durability features. Ford's rugged cab and chassis construction means these new '58s are built to last. All this plus the proven fact that Ford trucks last longer adds up to America's No. 1 truck value.

See your local Ford Dealer for the latest in '58 trucks or the best in A-1 used trucks.

## FORD TRUCKS COST LESS

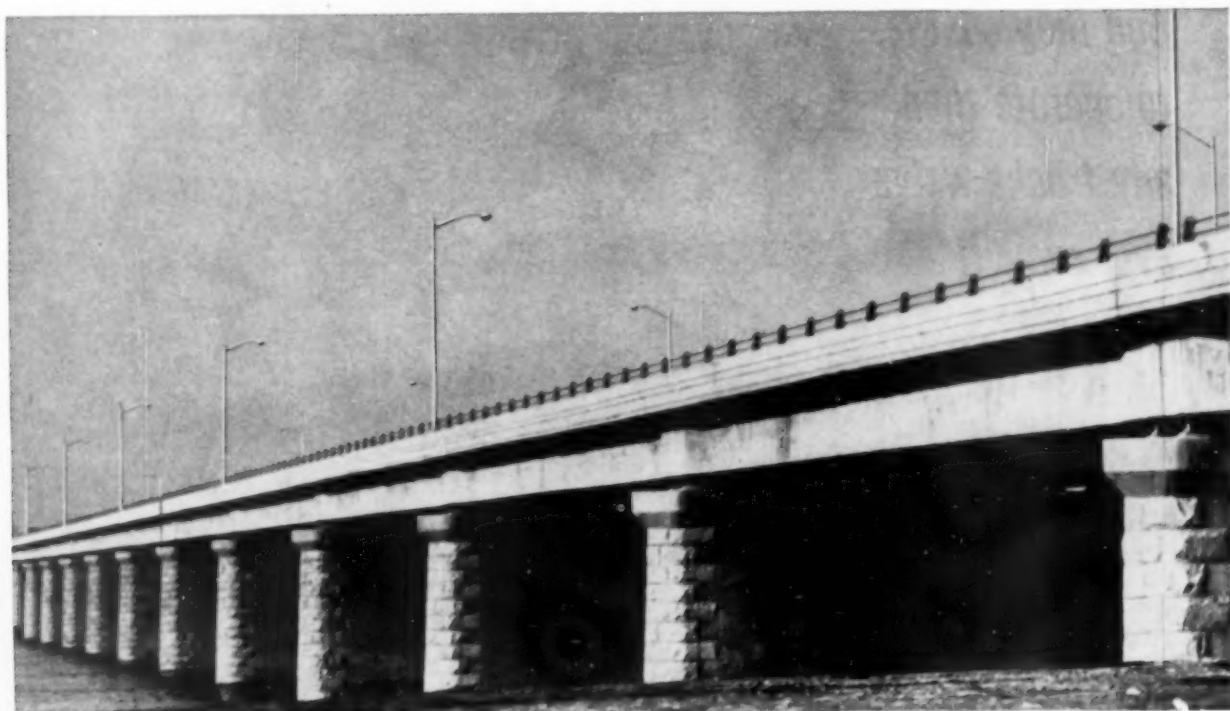
**LESS TO OWN... LESS TO RUN... LAST LONGER, TOO!**

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**ROADS AND STREETS, May, 1958**

## On the Wolcott Avenue Bridge

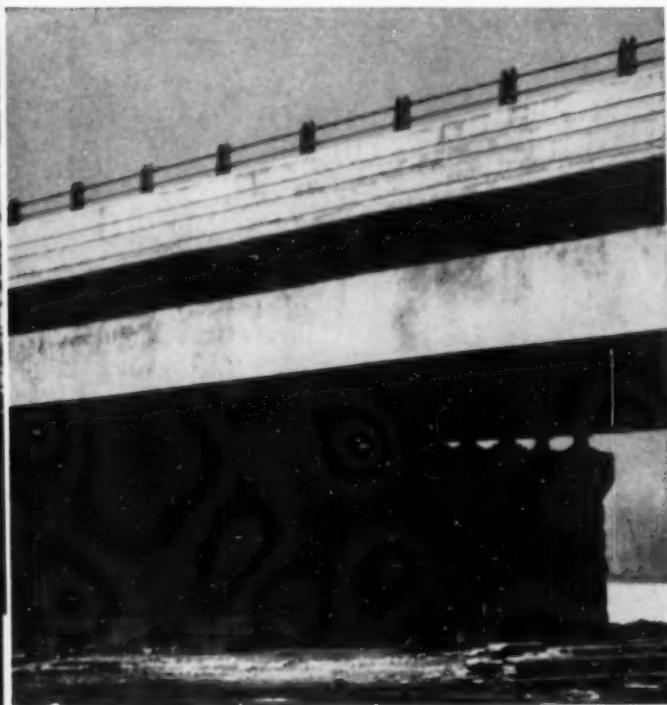
# extraordinary straightness of new



**Above**—This is a partially completed reinforcing assembly for girders in the Wolcott Avenue Bridge. Super-Tens Wires have been inserted in six of the twelve flexible metal tubes in this particular assembly.

**Left**—This photo emphasizes the superior straightness of USS American Super-Tens Stress-Relieved Wire as it is uncoiled. It stays straight and lies flat, with no tendency to curl, which greatly simplifies handling.

# American Stress-Relieved Wire solves on-site prestressing problem



Fabrication of prestressed concrete for the Wolcott Avenue Bridge was made much simpler through the use of new USS American Super-Tens Stress-Relieved Wire. Super-Tens is unusually *straight* prestressing wire. It stays straight . . . lies flat. This development has solved a major problem facing the manufacturer of prestressed concrete.

## 120-Foot Beams Prestressed Without Difficulty

The Wolcott Avenue Bridge, near Hartford, Connecticut, is a new cast-in-place, slab and girder bridge construction. It is built of concrete girders post-tensioned on the job with an amazing new product, USS American Super-Tens Stress-Relieved Wire.

This wire has straightness and handling ease never before realized in the field of prestressed concrete. New Super-Tens Stress-Relieved Wire developed by American Steel & Wire eliminates the tendency of wire to return to its original shape. This tendency has been a major problem in making up parallel-wire, post-tensioning assemblies. By using new, *straight* Super-Tens Stress-Relieved Wire, however, the builders of the Wolcott Avenue Bridge not only saved time on the prestressing operation, but did the job more efficiently.

Spans are 120 feet long; girder webs are seven feet deep and twelve inches wide. The Freyssinet post-tensioning system was used. Each cable contains twelve 0.276" diameter USS American Super-Tens Stress-Relieved Wires.

Perfecting a straighter prestressing wire is the latest milestone for American Steel & Wire engineers, leaders in the application and development of steel wire and strand for prestressed concrete. If you are interested in prestressed concrete construction, get in touch with us today through our nearest Sales Office. Or write to American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

*USS, American and Super-Tens are registered trademarks*

### These are the people who built this bridge:

Owner: The Greater Hartford Bridge Authority  
General Contractor: Merritt-Chapman & Scott Corp., New York  
Designing Engineer: Thomas Worcester, Inc., Boston  
Supervising Engineer: DeLeuw, Cather & Brill, New York  
Consulting Engineer for Contractor: The Preload Co., Inc., New York

American Steel & Wire  
Division of

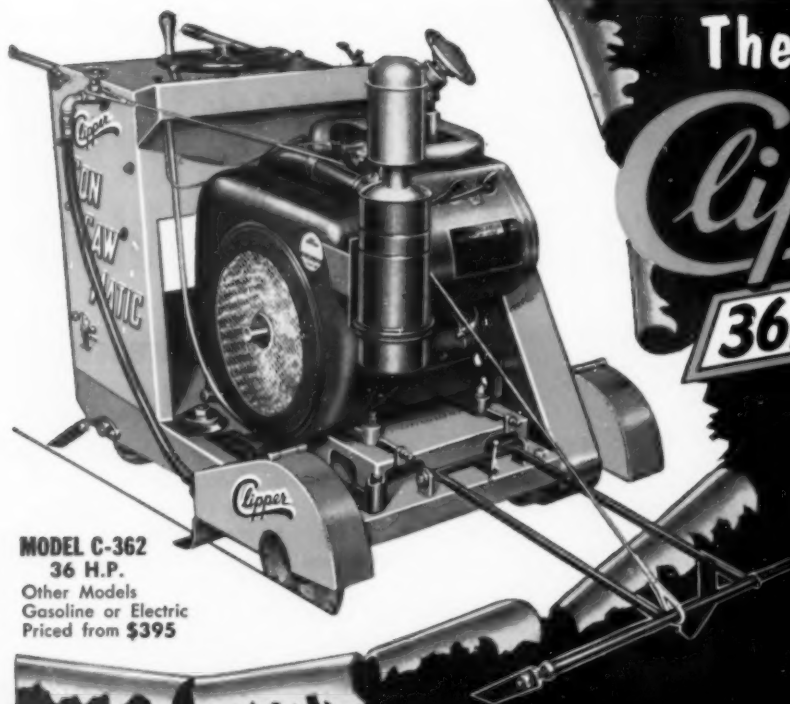


United States Steel

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**ROADS AND STREETS, May, 1958**



**MODEL C-362**  
**36 H.P.**  
 Other Models  
 Gasoline or Electric  
 Priced from \$395

The All NEW

*Clipper*  
 "SAILS RIGHT THRU"

**36 H.P. SELF-PROPELLED  
 CONCRETE SAW**

*features*

- DUAL BALANCE DESIGN
- POWERFUL HEAVY-DUTY TRANSMISSION
- POSITIVE BALL BEARING SCREW FEED
- 6 STEEL-CABLE-REINFORCED V-BELTS

**USE THIS HIGH PRODUCTION CONCRETE SAW FOR  
 FASTER CUTTING WITH LONGER BLADE LIFE**

**OVER 36 OUTSTANDING FEATURES FOUND ON NO OTHER SAW!**

DUAL BALANCE DESIGN—Precision weight distribution for ① Easy Maneuverability . . . one man lifts-up, lines-up, then saws, ② Constant adequate weight over the blade during cutting. Only Clipper has it!

POWERFUL HEAVY DUTY TRANSMISSION—Exclusive Abrasive Coated Drive Wheels transmit power to rear wheels for continuous forward thrust.

POSITIVE BALL BEARING SCREW FEED—Assures accurate cutting depth control. A MUST for abrasive blades.

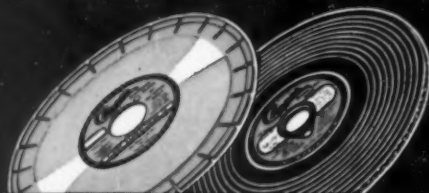
6 STEEL-CABLE-REINFORCED V-BELTS—Delivers full 100% power to the blade for best economy and performance.

**RUGGEDLY BUILT TO GIVE YEARS OF TROUBLE FREE SAWING!**

**FREE DEMONSTRATION**

THERE'S A CLIPPER BLADE FOR ALL SAWS —  
 ANY AGGREGATE — EVERY JOB!

Call Your Clipper Factory Trained Representative  
 Collect for Immediate Shipment or Demonstration



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*Before you pour*



**...add  
CLINTON WELDED WIRE FABRIC  
for built-in traffic-resistance**

For long-lasting, trouble-free roads, nothing surpasses reinforced concrete. Reinforcement cushions the impact of heavy, fast-moving vehicles . . . holds cracking to a minimum by distributing load stresses over a wide area . . . helps concrete resist contraction and expansion caused by sudden temperature changes . . . and cracks that do appear are held tightly in check, preserving a smooth, solid road surface.

And Clinton Welded Wire Fabric is ideal for highway reinforcement. It is easy to install—it's economical—and its light weight means you also save on transportation costs. Clinton Welded Wire Fabric is available for fast, nationwide delivery, in gages, lengths and widths to meet every specification. For further information and quick order action, call your nearest CF&I Sales Office.

WHEN THEY ASK...

*"is it Reinforced"*

SAY YES...WITH CLINTON WELDED WIRE FABRIC

THE COLORADO FUEL AND IRON CORPORATION: DENVER • OAKLAND • NEW YORK





*Before you order*

**specify**  
**CLINTON**  
**WELDED WIRE**  
**FABRIC** for...

***maintenance-free***  
***concrete pipe***

Maintenance-free pressure mains, highway culverts, sewer mains and drainage ditches are assured when you install reinforced concrete pipe. Reinforcement adds the strength of steel to concrete pipe . . . enables it to resist external loads and withstand internal pressure . . . holds cracking to a minimum.

Should a crack develop, the reinforcement holds it tightly closed, preventing dangerous and expensive leaks. Thus, it helps retain a smooth inner surface that offers minimum resistance to water flow.

Make sure the concrete pipe you install is reinforced. The use of welded wire fabric is more economical than other types of reinforcement, and assures a lifetime of maintenance-free service for concrete pipe. Top-quality Clinton Welded Wire Fabric is readily available in all popular gages, lengths and widths, in both the East and West. For further information, call your nearest CF&I Sales Office listed below.

WHEN THEY ASK...

*"is it Reinforced"*

SAY YES... WITH

**CLINTON**  
**WELDED WIRE FABRIC**  
**THE COLORADO FUEL AND IRON CORPORATION**



THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City  
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Accept this

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**CHALLENGE**

**...to UP your  
PROFIT MARGIN**

Yes . . . prove to me that 9-yd D Tournapull will handle more jobs at less cost than any other scraper. Call me at . . . . . (number)  
on or about . . . . . to arrange a demonstration.  
(date)

Name . . . . . Position . . . . .

Company . . . . .

Address . . . . .

City . . . . . State . . . . .

(Fill out and mail to your LeTourneau-Westinghouse Distributor)

We will prove to you that

**9-yd D Tournapull<sup>®</sup>  
handles more jobs  
... at less cost  
than any other scraper**



You should see this scraper work in order to judge its value on your spread. You should see the "D" self-load on clean-up and finishing operations . . . see it work by itself, spreading and leveling sub-grade, removing top-soil, building driveways, terraces, leveling building sites . . . see it keep pace in line with big production scrapers. You will then see why D Tournapull *handles more jobs at less cost* than any other scraper. And we'd like to prove it to you . . . with a *demonstration on your job*.

There's no obligation on your part to buy. Just fill out the above "request for demonstration" and mail it to your LeTourneau-Westinghouse Distributor.

DP-1941-DC-1

... for more details circle 296 on enclosed return postal card

**LETOURNEAU-WESTINGHOUSE COMPANY**

*A Subsidiary of Westinghouse Air Brake Company*

**WHERE QUALITY IS A HABIT**

PEORIA  
ILLINOIS



# WHEN THE PROBLEM IS

## BIG ROCK

# AND PLENTY OF IT

8,000 feet up Mt. Shasta in northern California, Everitt Memorial Highway is being extended to Panther Meadows where a new ski resort is under construction. Timber is being cleared to make way for the six miles of new road; overburden is being moved; crushed aggregate is being brought in. But the toughest job of all is wrestling with tons of big rock. No wonder J. W. Briggs & Associates are using a fleet of Caterpillar track-type Tractors—seven D8s and three D7s.

"We especially like those Cat-built U-blades," says Supt. M. S. McMillan. "They really stand up on this rock." As with any piece of big yellow equipment, the reason for this better wear is better design and manufacture. The No. 8U Bulldozer shown on the D8 in the picture, for instance, has cutting edges made of special "Hi-Electro" hardened steel. Powering this 11' 11" blade is the 191 HP (flywheel) Cat D8 Tractor.

For more details circle 254 on enclosed return postal card.

Every detail of construction of this famous machine aims at easy handling of tough work: roller rims are forged of selected deep-hardened steel; track pins are made of selected medium carbon steel, "Hi-Electro" hardened; diagonal braces on the track roller frames are heavy steel forgings welded to nearly half the length of the frames.

Dozens of other features attest to the ruggedness of Cat-built crawler equipment and attachments. Get the whole quality story with a no-holds-barred demonstration on *your* toughest job. Call your Caterpillar Dealer today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

## CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WHEN THE GOING  
IS REALLY TOUGH



### INTERSTATE HIGHWAY PROJECTS—III

# Contractor and Traffic Took Turns on Freeway Job in the High Sierras

*Unprecedented traffic interruption required in four-laning California U.S. 40 through Truckee Canyon. Special job sequence and other cost-increasing provisions included in \$5 million contract awarded to Gibbons and Reed Co. of Salt Lake City.*

**I**F YOU were bidding on a job where a two-lane road had to be converted into an expressway along a narrow canyon shelf, and where you had to do the job in stages under heavy traffic, with only intermittent equipment operation—you would estimate your unit prices rather high.

For reasons such as these, high job costs were anticipated by the California division of highways when the 5.4-mile segment of U.S. 40 near the Nevada line came up for bids in March of 1957. Gibbons and Reed Co. of Salt Lake City took the job at a price well above prevailing California road prices. In fact this job, plus one other "unusual project" awarded in California at the time,

● Motorists and truckers piled up for a mile at the flagstop, while Euclids roared through, taking their turn.  
(Roads and Streets Staff Photos.)



threw the department's construction bid price index so far out of line that a public statement was issued to explain the reason. The index for the first 1957 quarter was up 22 percent over the first 1956 quarter.

This was due to "two large and extremely difficult projects on which conditions will be encountered during construction that ordinarily are not found on projects elsewhere in the state." An alternate Index calculation omitting the two projects showed state-wide prices elsewhere actually to be down 1.0 percent for the quarter.

As explained by Richard H. Wilson, then assistant state highway engineer (since retired), the U.S. 40 reconstruction involved heavy grading in a narrow canyon, with a main-line railroad (Southern Pacific), a power flume and the Truckee River often closely adjacent to the construction. No detours were available around this leg of transcontinental U.S. 40. Traffic between Reno and the Coast had to be handled through in some way, or rerouted entirely. Traffic handling was foreseen by the engineers to be an especially costly item since it would involve serious delays to equipment during working hours. Also the grading had to be done in uneconomic stages while traffic was shifted from one roadway or bench to another. And the high-altitude, heavy-snow locality imposed a short working season.

- Why no detour was possible is shown by this photo of U.S. 40 through Truckee Canyon.



- Another photo during "Road Closed" period. Euclid rear-dumps hauling over compacted new grade, while long line of vehicles waited for the "Go Through" signal. This disturbance of normal traffic flow, incidentally, required many miles of travel to clear up. Bunched traffic flow was often a hazard and a slowing factor as far as 30 miles west of the project.

With this preamble, it will be interesting to look at some of the U.S. 40 job details. Gibbons and Reed moved in late in March 1957 and began heavy grading late in May. By December some 99 percent of the 1,020,000 cu. yd. of grading (largely rock) had been done and the subbase and base work were well started. Three shovels—a Lima 3½-yd. 1201, a Northwest 2½-yd. 80D and a Bucyrus-Erie 3-yd. 71-B—worked at separate locations, making frequent moves to handle the work in the sequence required under the special grading plan.

The grading equipment also included 15 heavy tractors (Cat D8s and International TD-24), 14 Euclid rear-dumps, a sheepsfoot unit, three heavy compactors (Southwest Welding and Bros), 5 Cat 12 motor graders, 3 tractor shovels (Traxcavator and Michigan), 6 compressors (Ingersoll-Rand, Gardner-Denver, and Chicago Pneumatic), and 9 light plants (Lincoln and Homelite).

The drilling was done largely by two tractor-mounted drills. One was a Worthington drill using 3-in. bits, mounted on a Cat D8 and supplied by a Worthington 600 compressor also mounted on. The other was a Joy unit with 4-in. bit carried on an Allis-Chalmers HD-19 and supplied by a Gardner-Denver 600 compressor.

This, then, was the outfit which had to be kept operating double-shift despite the traffic handling. In compliance with the special provisions, the following detailed cross-section diagrams supplied in the plans, the cuts and fills were constructed to a definite sequence.

The stages were as few as two and as many as seven. A typical circumstance at a fill location was handled in the following manner:



● Northwest 80D shovel removing boulders and spoil along cut slopes during "Road Closed" period. Anything that the shovel could pick up and load into the Euc was hauled for riprap.

1. Preliminary benching was done to get equipment into the adjacent cuts.

2. The existing road lying toward the river some 30 ft. from the new centerline was widened, using material that would eventually be enveloped as part of the new fill (see accompanying sketch).

3. The fill for the new grade was then partially constructed, enveloping part of the original roadway (1b in sketch), while traffic used the widening strip along the new roadway (see Step 2).

This strip was gravel surfaced and kept in condition by continual blading and sprinkling.

4. Traffic was next diverted to the top of the new fill.

5. The new fill was widened to full cross-section and ripped on the stream side.

Cuts were not unusually large, although one cut reaches a maximum up-slope height of 125 ft. The largest fill was about 100,000 cu. yd.

In following this scheme, with variations, the contractor was required to keep two traffic lanes open at all times for two-way movement under flag control. This brings us to the most-widely publicized part of the job, namely, the handling of the summertime throng of tourists and interstate truckers which poured over nearby Donner Summit and had to stream through the project. This traffic averaged 4400 daily during the summer months, with peak counts as high as 510 per hour



● At the height of the summer's grading work. TD-24 International dozer spreading shovel rock during "Road Closed" period.





## Equipment Action During Road-Closed Periods

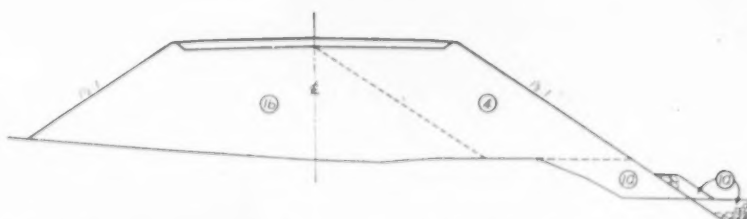
Motor grader operator towing a Southwest Welding pneumatic compactor down the existing road to a work location, while traffic waited. A management problem was to plan such equipment maneuvers to fit into the "start-stop-start-stop" work schedule.

during the double-shift working period.

In accordance with the special provisions, a schedule was originally planned which would provide alternate "Road Open" and "Road Closed" periods of two hours each, around the clock. The bidding was on this basis. This sequence however was not used. A somewhat similar schedule was devised with the aim of delaying traffic not over 45 minutes. On only five occasions were delays in excess of 1½ hours experienced. The schedule governed traffic movement over the 14-mile segment west of the Nevada line including the 5.4 miles through the Gibbons and Reed job and another project adjoining.

During the "Road Closed" intervals, the equipment worked full speed. During "Road Open" all equipment movement except supervisors' pickups ceased along traffic lanes when there was heavy travel, and was restricted at other times.

Vehicles were stopped and held single-file at each end of the project, with the aid of warning and in-



- One of many cross-section diagrams contained in the plans, showing the sequence of grading required to provide for traffic flow during the various stages (code lettering refers to instructions in plans and specifications). Old roadway seen below Area 4.

structional signs beginning well back from the flag stop. Comfort stations were provided for the waiting motorists, and an enterprising vendor did a "land office" business dispensing coffee, cokes and sandwiches from a mobile unit.

After work was again resumed, hauling from shovel to fill was routed to take full advantage of the

well-maintained roadway and roadway lanes, the rear-dumps making good yardage in the absence of traffic. This scheme hence wasn't without its advantage to the contractor. At the agreed time the flagmen at the two ends simultaneously began letting vehicles through, while equipment operators pulled off the road and waited, or kept busy on



- Sanitary facilities were stationed alongside flag stops, for the benefit of motorists who often had to wait an hour.



- Triplex pneumatic compactor used behind culvert abutments. This type of work could go on at all hours (except when waiting for material arrival).





● Examples of the elaborate sequence of signs used to bring the motorist safely up to the flag stop. Battery-operated flashers were mounted on many of the signs.

any off-road work that could profitably be done. In general, however, little production was possible while traffic was flowing. Shovel operators could do nothing other than loosen big rocks, do floor cleanup or occasionally some sidestepping.

Flagmen were also stationed at points where hazards existed through the job, or where equipment was allowed to cross during traffic lulls. A maximum of 32 flagmen were used during the peak of two-shift work, tapering off to 10 or 12 men during the light traffic weeks of autumn.

● Drilling on up-hill benches was often possible at a steady pace. Blasting was done during any "road closed" interval. The chief concern was to restrict rock fall due to the proximity of the rail line and the canal below. Millisecond delay caps were used in patterns designed to throw toward the uphill side.

The California division of highways, which heretofore has never felt it necessary to delay traffic seriously, cooperated by giving widespread publicity to the U.S. 40 project. Motorists and truckers were warned via radio, TV and newspapers of the likelihood of delay. The contractor posted delay warning signs at highway junction

points beyond either end of the project. Although no specific re-routing suggestions were made, many motorists used alternate routes over the mountains, principally U.S. 50.

In preparation for the 1958 season Gibbons and Reed crushed and stockpiled a good part of the 210,000 cu. yd. of base stone. A

Flaherty crushing plant was set up under a 500-ft. cliff, where it utilized rock drilled and shot down from benches as high as 200 ft. above the crusher. A pair of nervy dozer operators carved a steep zig-zag trail up to the shelf locations, and remained to doze rock down for rehandling below.

The 1958 program of paving and



● Arrow points to a pair of tractor-mounted drills, perched 200 ft. up a cliff. Blasted rock was dozed down to the crusher (which is obscured in this picture by the road-way shelf in foreground).

# Sorry you're delayed.....



Widening U. S. 40 through this canyon to a 4-lane freeway is a difficult and dangerous job. We're working day and night trying to get it done as quickly and safely as possible.

● First page of leaflet issued to explain delay to motorists.

cleanup is not expected to entail serious traffic delays. The 1957 experience on U.S. 40, California engineers hope, will remain in the memory as an "unusual" one.

● Ed Jolly is superintendent for Gibbons and Reed Co. on the U.S.

40 project, with Shirley Craig, assistant superintendent, W. H. Arvin and Earl Baker grade foremen, and Richard Shenefelt, office manager. John C. Petersen is resident engineer for the California Division of Highways under Alan S. Hart, District Engineer of District III.

## Big Ones Dragged Away for Secondary Shooting

Many large boulders had to be sledged to a point well off the roadway, so that they could be drilled and blasted. Truck-mounted Ingersoll-Rand Gyro-Flow 600 compressor in use here, along with Cat D7.



## Booklet Widely Circulated to Explain Motoring Delay

Shown here is part of the front page of a 4-page leaflet which the California Department of Highways devised to help explain the unprecedented U.S. 40 project.

Inside pages showed sketches of the different operations required to build a modern highway. It then went on to explain the unusual circumstances making it necessary to hold up traffic at each end of the job, so as to give the equipment a turn to work. It pointed out the hazards such as tumbling down of loose boulders, which were being avoided by the delay scheme.

The booklet also informed the motorist of the \$70 million worth of modern freeways being built on U.S. 40, to make it safer and more convenient.

## Correction

### Our April Newsletter

The newsletter in April *Roads and Streets*, which was rushed to the printer over the weekend following the passage of the new highway bill by Congress, contains a couple of errors.

One slip of the type second paragraph, fifth line, page 1, said that the "new Act lists the pay-as-you-go Byrd Amendment." It should have read *lifts*.

The other: on page 3, third paragraph, sixth line should have read "The new law, however, will *now* permit the BPR to reimburse the state for materials delivered to the job. . ."

# "I LIKE THEIR MECHANICAL DEPENDABILITY...LIKE THEIR LONG LIFE...LIKE CATERPILLAR DEALER SERVICE..."



B. K. SOBY, vice president and secretary of the John Dieseth Co., Fergus Falls, Minn., amplifies the above by saying of his DW20s and other Caterpillar-built equipment: "They're good all-around machines with high production capacity. They're well-engineered down-to-earth machines that can be depended on to do a good economical job."

Mr. SOBY has ample opportunity to prove out his preference for CAT earthmoving equipment on this highway improvement job—U. S. Highway 75 between Madison and Bellington, Minn. Working in hog-wallow type gumbo, two Cat DW20s with matching No. 456 Scrapers are pushloaded by a D9 equipped with No. 9S Bulldozer. The No. 456s are carrying 22 cu. yd. per load on hauls from  $\frac{1}{4}$  to  $\frac{1}{2}$  mi. The job involves moving 623,000 cu. yd. —50,000 yd. borrow and the balance general excavation. A Cat No. 12 Motor Grader maintains scraper haul roads.

Now a new DW20 (Series F) Tractor is available. It features a SUPER-TURBO Engine that provides 320 HP (maximum output) . . . 28% torque rise . . . top speed of 35.8 MPH!

The SUPER-TURBO incorporates a new concept in diesel engine turbocharging—an air induction system unique in earthmoving machines . . .

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and another Caterpillar first. This system allows use of more of the Turbocharger's potential than was possible before. Results: twice as much torque rise, higher horsepower, better acceleration and gradeability. But more important, faster cycles, greater production and more profit—for you.

For lowest *total cost* earthmoving machines that give profit production with a minimum of down time—for nearby parts and service you can count on—contact your Caterpillar Dealer. He knows *your* problems, and will show you how Caterpillar equipment can meet them best.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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—First in the Industry  
—First in Performance



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ROCK GRIP WIDE BASE    ROCK GRIP

ROADS AND STREETS, May, 1958



## HIGHWAY ENGINEERING CAN'T BE STAMPEDED

THE WORD "STAMPEDE" has cropped up in Washington, and it is a good one to use here, now that Congress has voted the new funds for the road program. This is the time to pause and consider carefully some very important fundamentals and avoid costly "stampede" thinking.

First, while thanking Senator Gore and all the others for their part in passage of the Federal Highway Act of 1958, let us remember that this law is only a stop-gap. It provides certain much-needed funds for immediate use. It temporarily lifts the Byrd Amendment from the previous act, which would have caused a serious dip in the Interstate program.

But, in the words of General Prentiss of the American Road Builders Association, the new law does not assure the long-range, sustained program of roadbuilding essential if the work is to be planned and executed economically. It fails to solve the long-term financing problem fully. Rather, "it merely postpones the inevitable day of reckoning," to quote General Prentiss, whose full words were, "Sooner or later we must face up to the full implication of the increased cost estimates, and to the fact that the funds earmarked for the Highway Trust Fund are not enough to do the job."

● A stretch-out in the road program still looms unless more highway user funds are channeled into the trust fund.

Congress will need to continue its study of highway needs, and to enact further legislation in another year or two. And the state legislatures have their end to keep up, unless they are willing to abdicate the highway responsibility entirely to Washington.

Second, as the highway departments jump into action to adjust their work to the new law, with its increase in immediate funds, let nobody forget the importance of adhering to orderly planning and established engineering procedures. We have enough inflation of costs now, without the still higher costs that will be imposed if "crash" methods are resorted to, or if the highway departments yield too far to local "make work" pressure.

It is true that with very little engineering great sums could be spent usefully at once on such work as pavement and bridge widening, resurfacing, stepped up maintenance, shoulder armoring, easement of curves, and general renovation of existing roads on their existing obsolete profiles and alignments. As a last resort, in a deep depression dip, that type of project would show creditable value for the sums spent. But the serious harm of such emphasis lies in that it throws the long-range state-wide planning and scheduling out of kilter.

● The highway departments, after years of waiting for the chance, are now permitted to plan the road program on the long-range basis required to really meet traffic needs for an expanding population. The 1956 act provided partially the long-range financing, and the wheels are now turning on the advance work with its two-year and longer lead time—time that makes all the difference between constructing soundly and jerry-building that would produce thousands of miles of roads that are obsolete before they are built.

The new funds for ABC projects will make possible many relatively "quick" jobs. But these jobs must fit into the framework of the careful planning and priority scheduling presumably already well advanced if the state highway department has been on its toes. This won't lessen the value of such jobs in providing employment and stimulating sales of construction equipment. It *will* help us create a better highway system for our expanding population.

What about the contractors? Even after twelve years of unbroken rise in highway construction volume in most states, the contractors today still are capable of taking on a lot more work. With their new modern equipment, productivity is not their worry. The contractors, collectively and as groups, are concerned most with being assured a steady, orderly flow of jobs, so that they can map their own activities with greatest efficiency. This is the final pay-off. This will give the most miles of new highways the soonest, and at less cost to the public.

### When Engineers Go Over to Contracting

"IT IS A good thing for the highway department that some of their engineers go with contractors."

This is the view of a well-known contractor, Grant Thorne of Salt Lake City, speaking at the recent Utah Highway Conference. While some highway department administrators frown on this cross-pollination, we believe that others will agree with Thorne's belief that it does help make for better contractor management.

A company owned by an ex-highway department employee, or a firm which employs such men among its key people, knows better what is expected today of a highway contractor. More important, the "why" is better understood.

Beyond that, an engineer-turned-contractor can be the best type of man to help foster mutual understanding and good faith between the department engineers and the contractors.



- Skimming and shallow spreading to bring inner shoulder and median to practically finished grade, using two D Tournapulls and a D6 pusher.

## Fast Cleanup on This Michigan Project

### *(This Month's Cover Scene)*

**S**HOULDERS and depressed median were given a final filling in and shaping and left in nearly finished condition by a team of scrapers, here pictured. The job: U. S. 78 east of Lansing, Michigan, involving double-laning and reconstruction totaling 19 miles of 24-ft. concrete pavement. The contractor: Sargent Construction Co. of Saginaw, Michigan.

The two LeT Wesco D Tournapulls pictured, working with a Caterpillar D6 dozer, easily kept ahead of the 3,000 ft. average daily pace set by the pavers. On some

days the team progressed 2 to 3 miles. The prevailing material on the project was a loose sand which justified some pusher service in loading and unloading. Much of the scraper hauling and dumping, however, was done unassisted despite the soft going underfoot.

This lengthy season's run illustrates the large productive capacity of today's concrete paving equipment. This contractor during 1957 completed this job and also five other jobs in Michigan, totaling 83 miles of pavement in all, using three paving outfits.

On U. S. 78 a double paver outfit placed the entire yardage largely

in late summer and autumn. Batching from a simple plant consisting of two 50-ton Butler bins and a 1,200 bbl. cement dock (two set-ups), the Sargent crew employed among other units a new Heltzel finisher. A pair of Clipper saws were operated by one man on centerline cuts with the aid of a guide frame.

Finishing equipment was handled on and off of a Rogers trailer using a Tournacran and tractor winch. Maximum day's pour for the job was 4,460 ft. of 24 ft. wide pavement. Ray Burns was superintendent on paving, and Dick Wright on grading.



- A pair of Clipper saws cutting centerline, framed together with a guide tongue which rode the pavement edge. This tandem outfit, one saw making half depth cut, the other carrying the cut to full depth, reportedly produced about 4,000 lin. ft. of  $\frac{1}{8}$ " x 1" dummy joint per day, using Diamond blades and making the cut on about the seventh day.

# "A plenty tough job so we called on Caterpillar equipment for this one"



South of Camarillo, Calif., J. E. Haddock, Ltd., is relocating and improving 5 miles of U.S. 101. Some 1½ million cu. yd. of rock are being moved, 7,000 cu. yd. on an average day. Three Caterpillar DW21-Athey PR21 rigs help, carrying 18 cu. yd. apiece. The round trip is a mile, including a 12% grade.

"This job is plenty tough," says Neal E. Saul, project superintendent, "so we called on Caterpillar equipment for this one. Caterpillar gives us satisfactory service with a minimum of down time."

Now Athey PR21 Rear Dump Trailers are powered by new Cat DW21 (Series D) Tractors. They feature new Super-Turbo Engines that provide 320 HP (maximum output) and twice as much torque rise as before! Results: faster cycles, greater production — for you.

Other features, as articulated design and non-stop 90° turns in 33½-ft. diameter, let the DW21-PR21 maneuver in crowded, cramped quarters. Three-stage, double-acting hydraulic rams, 60° tilt and

straight body interior permit fast, clean dumping. The PR21 is 14 ft. 1 in. long, 9 ft. wide, allowing fast, easy shovel loading. Below are other Athey trailers suited to construction work.

The complete trailer line of Athey is available through your Caterpillar Dealer. Let him demonstrate on *your* job the hauling unit that's best suited to your requirements.

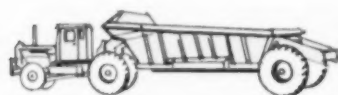
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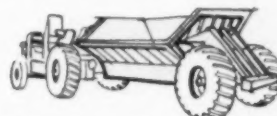
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**DW20-PW20**, 40-ton capacity, speeds to 35.8 MPH. Exclusive 3-door, bottom dump design and high arch axle minimize dumping resistance.



**"PR" Series** — rear dump. Available for the DW21 (above), DW20 (34-ton cap., 23-second dump), DW15 (22-ton cap., speeds to 37.2 MPH, 13-second dump).



**"PD" Series** — side dump. Available for the DW20 (30-ton cap.) and DW15 (20-ton cap.). Both have 70° dumping angle and can dump on the run.



# The "Pot is Boiling" in Concrete Pavement Design

*Or so it would seem to delegates at the recent ACI convention in Chicago, where committee reports looked toward continued evolution of concrete for highways and airports.*

By Hubert C. Persons, Contributing Editor

**F**UTURE concrete pavements should be designed for truck tires of smaller diameter and higher air pressures.

Concrete pavement mix designs may have to be changed to overcome a tendency toward surface slipperiness when the road is wet under modern traffic.

A better understanding of the mechanics of fatigue could conceivably help engineers prolong the life expectancy of concrete pavements and save "fantastic amounts."

Prestressed concrete pavement is becoming competitive with conventional pavement from a cost standpoint, and may be used in airports. More continuously reinforced concrete pavements are slated to be built.

These are some of the developments predicted in papers and committee reports at the 54th annual meeting of the American Concrete Institute, held in Chicago in February.

ACI Committee 325 on Structural Design of Concrete Pavements for Highways and Airports sponsored one entire session. Papers relating to concrete pavement were featured on several other programs. The Committee report was delivered by Chairman E. A. Finney, director of the highway research laboratory of the Michigan state highway department. Mr. Finney raised the question as to whether pavements designed and built today will be adequate 20 years hence.

The chairman explained that Committee 325 was organized ten years ago to develop recommendations for the structural design of concrete pavements for highways and airports. The committee had presented its first report before the 1950 ACI convention. The committee's new objectives, Mr. Finney

said, cover reinforced pavement, prestressed pavement and concrete overlays.

● *State Requirements Differ.* The report also called attention to "vast differences" between the States in construction requirements and suggested that such wide differences lead to higher construction costs.

In the matter of permissible axle loads for commercial vehicles, the committee said that the frequency of axle load applications is increasing in proportion to traffic. This continuing trend, the report said, could represent an imposing total number of axle loads to be carried by the highways of 1980. The committee also said it is expected that no future road will be built less than 24 ft. wide regardless of traffic conditions. It was further reported that paved shoulders pay for themselves by extending the structural life of the slab, reduce maintenance cost and provide greater safety and convenience to highway users.

Following the presentation of the report of Committee 325, three subcommittees of Committee 325 submitted recommendations. These were by Subcommittee 6 on Prestressed Concrete under the chairmanship of J. A. Bishop, U. S. Naval Civil Engineering Research and Evaluation Laboratories, Port Hueneme, Calif.; Subcommittee 7, on Continuous Reinforcement in Highway Pavements, J. D. Lindsay, Illinois Division of Highways, chairman; Subcommittee 8, on Design of Concrete Overlays for Concrete Pavements, L. M. Arms, Portland Cement Association, chairman.

The subcommittee report on prestressed pavements said that although only a few prestressed pavements have been built in the United States and those experi-

mentally, investigations in England and France have proved that prestressing can give a pavement slab many times the load-bearing capacity of a conventional pavement slab of the same thickness. It was predicted that prestressed pavement is becoming competitive with conventional pavement and that cost differentials will be reduced as contractors gain experience and as techniques are perfected.

● *Continuous Reinforcement.* Although sawed joints have eliminated many of the pavement defects attributed to joints, research is to continue to determine whether continuously reinforced concrete pavements are economically feasible. The report of Subcommittee 7, presented by Chairman J. D. Lindsay, reviewed pavement jointing practices of past years showing that jointing problems led to experimentation with continuously reinforced pavements. (See report on 10-year Illinois test road results in *Roads and Streets*, March, 1957.)

Chairman Lindsay used slide pictures to illustrate the Subcommittee report. He described continuously reinforced concrete pavements in service in Indiana, Illinois, New Jersey, California, Pennsylvania and Texas. All but the Texas project, he said, are experimental, one dating back to 1921. Currently, he said, state highway departments of Connecticut, Maryland, Michigan and Virginia are considering the construction of experimental projects using a continuously reinforced slab.

The conclusions of the subcommittee, Mr. Lindsay said, were that "from the experience obtained from the various pavements now in service it is possible to design continuously reinforced concrete pavements that will be exceptionally smooth-riding, require little maintenance and have a long service life." The Committee members felt, however, "that there is not sufficient evidence to conclude that the performance of such a pavement would be outstandingly superior to that of pavements of conventional design."

"Further, additional information is required to determine whether continuously reinforced pavements are economically feasible." Additional research is to be carried out to determine how slab thickness affects performance; whether the same percentage of steel should be used regardless of thickness, and to find an economical means of controlling the location of transverse cracks.





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"Certified Buy." This covers any make machine and includes his written guarantee. And "Buy and Try"—which carries a written money-back agreement.

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AND USED EQUIPMENT**

● *Concrete Overlays.* In presenting the report of Subcommittee 8 on Concrete Overlays, chairman Arms said that more than 300 projects had been built in 28 states. Of these, he said that 40 percent were rated good, 18 percent fair and only 2 percent poor. The report noted that it is becoming common practice to combine resurfacing and widening, and suggested that this procedure offers certain advantages one of which is that when the widening is integrated with the resurfacing it prevents separation of the thin edge of the resurfacing from the edge of the old slab.

● *Specifications.* Report of ACI Committee 617 on "Specifications for Concrete Pavements and Concrete Bases," was presented by Stanton Walker, director of engineering, National Sand and Gravel Association and National Ready-Mix Concrete Association, in the absence of committee chairman H. F. Clemmer. Mr. Clemmer, who was unable to be present because of illness, is materials engineer, department of highways, District of Columbia. The specifications recommended by Committee 617 apply to portland cement concrete pavements and bases for both highways and airports.

All committee and subcommittee reports were tentatively approved subject to letter ballot by the full membership of the Institute.

● *Modern Job Controls.* Automatic batching devices and other modern equipment used to assure control of concrete on the Illinois Toll Highway, were described in a paper by Edward A. Abdun-Nur and Joseph J. Waddell. Mr. Abdun-Nur is a Denver consulting engineer. Mr. Waddell is project materials engineer for Joseph K. Knoerle & Associates, Chicago, consulting engineers for the Toll Highway Commission.

Reference to saving in highway construction possible through an understanding of the phenomenon of fatigue was made by Gene M. Nordby, National Science Foundation. His paper reviewed past research on fatigue of concrete. Mr. Nordby is chairman of ACI Committee 215. "The potential economic return from evaluation of fatigue problems is almost fantastic," he said. "The saving in highway construction alone would be enormous if the life of concrete pavements could be prolonged ten years by an understanding of fatigue."

## New Publications

### Handling Calcium Chloride

The Calcium Chloride Institute has published Manual HM-1 on the subject "Calcium Chloride—Handling, Storing and Applying." This manual has been written especially for highway engineers, contractors and material suppliers who are using calcium chloride. With special emphasis on its use in the highway industry, its 42 pages provide data on approved methods for handling, storing, and applying calcium chloride. A special section is also included on winter maintenance work.

A free copy of Manual HM-1 is available by writing directly to the Calcium Chloride Institute, 909 Ring Building, Washington 6, D.C.

"YOU CAN BE A CIVIL ENGINEER." This is the title of an attractive, well pictured booklet, designed to interest young people in a career in civil engineering. Prepared by The American Society of Civil Engineers, Committee on Engineering Education, the brochure is directed to students of grade school and junior high school age.

It is hoped in this manner to kindle interest early enough in youngsters, to permit them to plan the high school curriculum with an engineering education in mind.

Distribution of the pamphlet is authorized by ASCE's Board of Direction. Anyone wishing a copy should address The American Society of Civil Engineers, 33 West 39th Street, New York 16, New York.

PAVEMENT CONDITION SURVEYS, SUGGESTED CRITERIA. Highway Research Board special report No. 30. Price \$1.80. Sent on request to the Board at 2101 Constitution Avenue, Washington, D. C. This 62-page booklet covers forms, field procedure, project record cards, safety measures for workers, definitions, etc.

"MOTOR TRANSPORTATION PRINCIPLES AND PRACTICE," by William J. Hudson and James A. Constantine. The Ronald Press Company, 15 East 26th Street, New York 10, N.Y. 695 pages. Price \$7.50. This book contains data valuable to highway administrators and planners and students of government transportation, as well as to operating personnel of motor carrier companies.

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# "The No. 933 TRAXCAVATOR is the only tool for us when we're working in tight corners"

HAT's the word from Deane L. Jensen of Long Construction Company, Inc., Billings, Montana. Operator C. L. Clark agrees. "It's a nice little rig. Handy for an operator because you can do anything with either hand. You can operate the bucket with the right hand and shift with the left. Loading out of a bank, I've loaded as high as 80 cubic yards an hour. I've backfilled in buildings in places so small you had to have the bucket clear up to turn around. Had it in places 24 feet square with a wall all around."



In the pictures on this page you see Mr. Clark and his Cat No. 933 Traxcavator working on a parking lot, street and driveways for the Fair Lane Shopping Center in Billings. The "nice little rig" scoops out dirt for loading onto trucks, spreads gravel for street foundation, dumps trash. 4,500 cubic yards of material were brought here by truck and spread by the No. 933. The Traxcavator sandwiched in this work with other construction jobs in the area for Long Construction Co.

See a demonstration of the No. 933 right on *your* job. Call your Caterpillar Dealer today. And after the demonstration, have him explain how his expert service and factory-quality replacement parts will protect your investment in Cat-built equipment.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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The No. 933 offers a standard bucket of 1 cu. yd. capacity. Also available, as a directly interchangeable attachment, is this new  $1\frac{1}{8}$  cu. yd. *Side Dump Bucket* which dumps to the left as well as forward.

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Maybe Now It Will  
Pay You to Rip It**

# RIPPING . .

*As newer techniques have developed, harder and harder rock is giving way to tractor ripping. The evolution of the art is here reviewed—and a new tandem method discussed which gives promise of important cost savings for moving rock that was formerly considered strictly for powder and shovels.*

**By Kenneth F. Park**

Earthmoving Consultant, San Leandro, California

**Y**ESTERYEAR—well within the experience range of many contractors—rippers of towed design, pulled by gasoline powered track tractors, were put into cuts classified (and paid for) as rock. They ripped sufficiently well for subsequent removal of material by scrapers. By today's standards those same materials would be considered easy to handle.

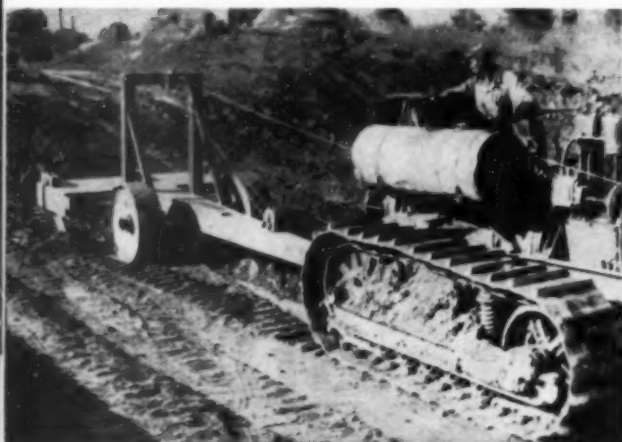
In the days of the early 1930s, the currently utilized rooters, or rippers, weighed around 7,500 lb. They were pulled by tractors with a total operating weight of about 30,000 lb., actuated by 75 flywheel horsepower. The investment was about \$6,700. Combined they would produce some 400

cu. yd. of scraper excavation an hour, for a machine and operator cost of less than \$5.00 an hour. There is no way, of course, to compare the worst material ripped in those days with the worst handled today, but down through the years contractors are known to have pulverized increasingly harder material. This has required progressively heavier rippers and correspondingly heavier tractors with comparably greater horsepower.

Obviously there have been ultimate limitations in the work obtained by each successive stage of such developments, chiefly at their most difficult point of application by materials of higher and higher impenetrability. Something extra was done

## 1930 and 1941

A 1941 model single-tooth ripper with a tooth weight of about 35,000 lb. Note the small furrow at lower right corner of picture. This was created by a "heavy duty" towed ripper pulled by a D8 and pushed by a D8 tractor (operation not pictured), which could not get any penetration. The rubber-tired couple here shown walked through this sandstone type of material at the speed of a fast walk.



● A towed type ripper of the 1930s. Note the compressor in the background where shooting was in preparation. This ripper weighed about 7,500 lb. was pulled by a gasoline "60".





# .. BEYOND RIPPING

## NOW, NEXT?

- New ripping technique in which two tractors—one pulling, one pushing—are capable of creating a down-pressure on one tooth of nearly 60,000 lb.—although weighing a gross of only 170,000 lb. This weight with the 640 horsepower used, creates the almost perfect combination of power and weight to operate the down pressure available.



for each performance improvement, of course, to make any such gain possible. And what were the improvements? First of all, it was necessary to start with the ripper itself. Then create improvements in tractor horsepower, weight and performance to make the ripper improvements possible. The greatest problem with rippers was to get them into harder and harder materials. The only way to do that was by increasing the weight on the point or points.

Everyone is familiar with the practice of dropping teeth from three, to two, to one as harder and harder rock is encountered. This, in essence, increases the weight on the teeth or tooth as the body weight is carried on less and less tooth surface. The next practice, not so widespread, when down to one tooth, was that of weighting the ripper body inside or on top, or both. About at this time the contractor figured he was through ripping. *Such need not have been the case!* But, then, where *was* and where *is* the limit? It can almost be said "There was and is no limit!" Put *enough* weight on the right kind of a ripper point and you would penetrate any kind of rock. The place to stop obviously is where the cost is too great compared with shooting.

The success of the presently current, integral, or back-mounted ripper on large tractors offered

first in September, 1953, has been in part a matter of design. Some tooth oscillation has been helpful, and the close-mounted and efficiently retractable frame and structure have added to better balance. The greatest improvement to ripper performance, though, has been in the development of much higher down pressures. Each increase in the weight on the teeth or tooth has created penetration into harder materials than was before possible.

Such a machine as the Caterpillar D9 tractor, with 320 belt horsepower, equipped with back-mounted ripper and a bulldozer in front, weighs about 84,000 lb. It exerts a maximum effective down pressure on ripper teeth of about 30,000 lb. The investment is approximately \$56,000. For continued ripper use, a machine cost of about \$27.50 an hour results including amortization, repairs and a \$4 an hour operator. The rate of ripping is pretty indefinite since theoretical travel, spacing and depth-of-breakage figures amount to quantities far in excess of those generally obtained. In fairly hard rock somewhere in the aggregate of 600 cu. yd. per hour, however, is known to have been removed by scrapers from areas under constant ripping. In good areas there is no reason why this yardage figure shouldn't be increased materially.

(Continued on page 67)

# MASSEY-FERGUSON

## PRESENTS



### FOUR NEW INDUSTRIAL CHAMPIONS

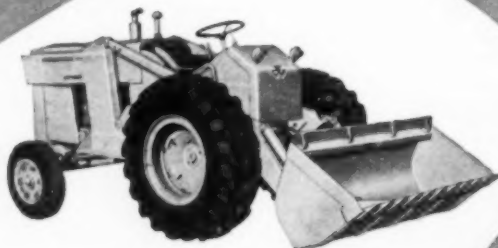
### WORK BULL and DAVIS PRODUCTS



The Work Bull 303 with 500 Loader  
and Davis Backhoe



The Work Bull 202 with  
Matched Davis Loader and Backhoe



The Work Bull 1001  
Multi-Purpose Tractor Loader



The Work Bull Fork Lift

Here's Massey-Ferguson Industrial Division's new line of industrial champions in the light and medium equipment field. All are designed to replace high-inventory, single-purpose machines — and at a fraction of the cost. Multiple, quick-change attachments are POWER-MATCHED to the basic tractor. You pick the power you need — and add the attachments you want. All from the same source. It will be the best investment you ever made in equipment!

# SEE HOW THEY SAVE MANPOWER AND EQUIPMENT COSTS!

## **New** **WORK BULL 1001**

**Multi-Purpose Tractor Loader** is convertible into eight different machines. You can change it in the field from a loader (¾ cubic yard payload capacity) to a pick-up street sweeper, to a fork lift, angle dozer, crane, rotary broom, backhoe, or scarifier. This unit features 52 h. p. engine, instant reversing (without shifting), 43° bucket roll back at ground level, load-shock absorber, power steering, and torque converter.

## **New** **WORK BULL 202**

**Utility Industrial Tractor** has 40 h. p., high-torque engine with amazing lugging power at low speeds. New industrial design permits extra maneuverability, vision, and control. It has more **POWER-MATCHED** attachments than any other tractor. Attachments include the famous Davis Loader-Backhoe and the Auburn Trencher. It beats anything in its price range.

## **New** **WORK BULL 303**

**Medium Range Industrial Tractor** is designed for tough assignments that demand more power, more weight, and reserve stamina. It has 52 h. p. engine, instant reversing, torque converter, power steering, and new double-disc brakes.

## **New** **WORK BULL 500 LOADER**

**Work Bull 500 Loader** with ¾ cubic yard payload capacity is specially matched to the Work Bull 303. It has direct line "bull-dozer" type thrust, but telescopic reach. Extra versatility is provided by pick-up street sweeper, crane, angle dozer, rotary broom, fork lift, and scarifier attachments. Davis Backhoe also fits directly to the loader frame.

## **New** **WORK BULL FORK LIFT**

**Work Bull Fork Lift** has the power, stability, and flotation to be labeled the best material-handling device for either off or on hard surfaces. Controls are located at operator's finger-tips. It is equipped so you can make quick changeover from one attachment to the other without additional hydraulics. Attachments include standard tines, block forks with side-shift adjustment, hydraulic bucket, log hook, dozer blade, scrap grapple, 20' extension mast, bottled gas load clamp, and cotton bale clamp.

## **Matched** **DAVIS LOADER-BACKHOE**

**Davis Loader-Backhoe** — The famous Davis Loader and Backhoe are specially matched to Work Bull 202. Loader attaches directly to the tractor which also has built-in pump drive and mounting. The Davis Backhoe fits directly to loader frame and can be attached or detached in less than five minutes. It is the only machine that can dig flush alongside a building — as well as do normal digging jobs. The Davis Loader, likewise, is highly versatile with many easy-to-change attachments.

### **Other**

#### **Power-Matched Attachments for the Work**

Bull 202 and 303 tractors include a scarifier-scraper, post hole digger, mower, multi-purpose rear blade, soil scoop, cable layer, tipping trailer, cordwood saw, and telescoping wagon chassis.



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Write for this free copy of the 28-page, fully illustrated brochure  
on the complete Work Bull and Davis Line. Ask for Brochure G-4.

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1009 SOUTH WEST ST. • WICHITA 13N, KANSAS



Work Bull 202 and  
Davis Loader are made  
for each other.

Work Bull 1001 has  
instant reversing,  
43-degree roll back.

The Work Bull 500 Loader  
and 303 has telescopic  
reach.

Davis Backhoe digs  
flush or from  
center.





## Bucyrus-Erie 71-B Marks Trend On Biggest Idaho Road Job

The use of a Bucyrus-Erie 71-B shovel indicates a new trend toward bigger equipment in northwestern highway work. This rugged machine was chosen by the prime contractors, F. H. Slate Co. and E. C. Hall Co. of Portland, Ore., to load out rock, topsoil, and gravel in mountainous terrain 10 miles east of Coeur d'Alene, Idaho.

The project is the biggest roadbuilding job ever let by the Idaho Department of highways. Running through Fourth of July Canyon, this 7.2-mile segment of the Interstate System replaces a narrow, winding road long cursed by irate drivers. It's the first four-lane divided highway ever attempted in such mountainous country. Some 1,700,000 yards of excavation are involved.

In digging this tough material, the contractors profited from the 71-B's dependability. They saw it maintain a good pace in areas where other machines wouldn't have stood up. Full air control, not just air assist, on all operating clutches and steering and digging brakes provided full-feel control . . . reduced operator fatigue.

In addition to the 71-B, Bucyrus-Erie Company offers a complete line of excavators from  $\frac{3}{8}$  to 4 cubic yards. All machines are convertible to crane, clamshell, or dragline front ends. Machines up to 2½ yards are also convertible in the field to hoe front end. Get all the facts on these machines from your nearby Bucyrus-Erie distributor today.

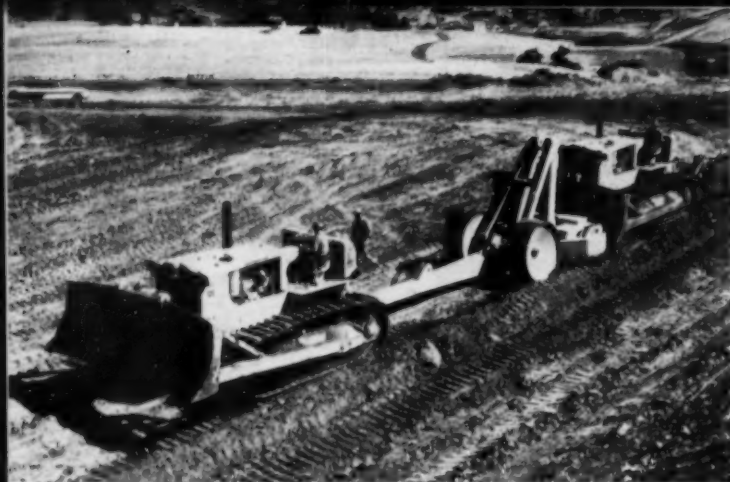
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● 54,000 lb. towed-type "giant" ripper. This group weighs about 224,000 lb., needed in order to get a concentrated tooth pressure of about 48,000 lb. The material is a very tough sandstone which crumbled at the top even while breaking into big pieces under the surface.



● A Caterpillar D9 tractor with back-mounted hydraulic ripper. One tooth being used to concentrate weight on the point. Note the straight shank. In spite of tremendous weight the back of the tractor is lifted.

In a borrow where extremely hard humps of material are encountered—in otherwise scraper dirt—the question arises "Can I rip it or must I shoot it?" Immediately, too, the problem is posed, "Is it cheaper to rip or shoot?" and a comparison of costs must be made.

Generally, shooting costs for shovel removal are then compared with ripping costs for subsequent scraper handling. The comparison is not a good one. Drilling and shooting alone for scraper removal is a more costly process than shooting for shovel work. The holes must generally be closer centered—though shallower—and shot differently. The final, and more complete evaluation of each method should be that in which the costs of the full operation of ripping, loading, hauling and spreading by scraper is compared to that of drilling, shooting, loading by shovel, hauling by truck and spreading by bulldozer. Where it is possible to rip, the cost differential mounts as the expense of process after process involved in shooting and truck haul is eliminated.

## COMPARATIVE COSTS

In the far West, particularly in California, shovel shooting in hard rock is quite well conceded to cost a minimum of 30 cents per cubic yard. By the newer method of using such a machine as the 320 hp tractor and back-mounted ripper previously mentioned, in many areas still thought of as "shooting rock," the tractor-ripper does a great job of breaking up the material. Much rock breakage is possible with this machine—and certainly it is working where we know rippers would

have been an impossibility a few years ago. The cost of preparing a pit for scraper work, even at 400 cu. yd. an hour, is not in excess of 7 or 8 cents. Comparing the whole scraper operation to that of shooting, shovel, truck and bulldozer use, there are substantial savings in the scraper loading and spreading costs as well as the saving created by ripping instead of shooting. As a justifiable consequence of his ability to rip into heretofore impossible materials, however, the user must expect substantially increased tractor repair costs.

This doesn't in any way discredit that staunch, old warrior, the shovel, because its usefulness should never wane. Progress, however, delegates all things to their proper niche and greater usefulness to each machine in its own field.

## TOOTH DETAILS

Changes in tooth design are used under varying conditions. A curved shank works better in laminated materials that do not block out too badly. A straighter shank breaks out blockier material better and has superior strength for the same amount of shank metal.

Actually, a high inclined clearance back of the contact point appears to create greatest improvement to the easiest and best breakage.

A fin-like attachment for the back and bottom of a ripper tooth is offered as another means of helping subsurface rock breakage. Each of these features has its function in bringing about an overall improvement in the operation.

On occasion, however, with the inevitable failure of even such pro-

ducers as the largest present-day tractor with its back-mounted ripper, rock situations are encountered which have prompted the building of giant towed rippers. By reason of the tremendous weight built in in excess of those of back-mounted, tractor rippers, the towed machine—34,000 lb. or more—has been able to rip where big, on-tractor units have failed to get penetration.

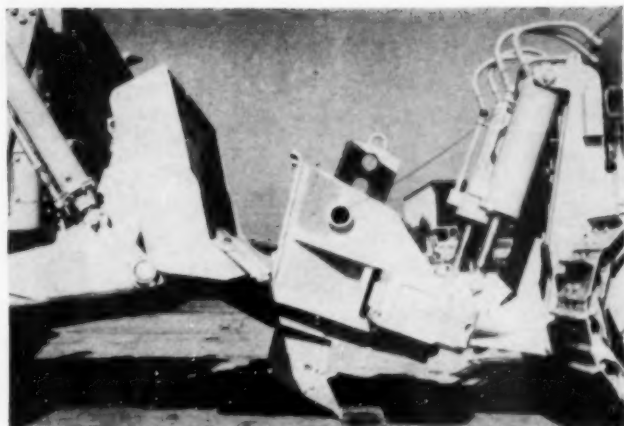
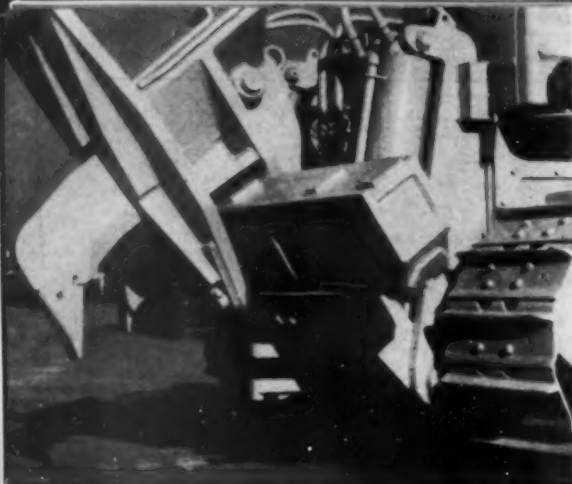
In one instance a 34,000-lb. ripper with full weight on one tooth was incapable of penetrating a hard, fine-grained blue-rock outcropping encountered in a scraper cut. The ripper weight was increased to 54,000 lb., increasing the single tooth contact pressure to about 48,000 lb. or a unit pressure of about 6,400 psi. Immediately, the machine began to fracture hitherto impossible ridges.

This is another instance showing the improvement of performance where a tooth pressure is sufficiently increased.

## MORE DOWN-PRESSURE

An interesting and illuminating incident happened when this 54,000-lb. ripper was temporarily stored in a dealer's yard. It was towed onto a concreted area where heavy tractors were in continual transit. The tongue was lowered to the concrete surface and the remaining weight was lowered to the single tooth on the same surface. The ripper moved forward slightly, and at a 45 degree incline the 5-in. tooth started down through 7 in. of solid concrete—ending its penetration just short of going through the slab. No power—just weight!

A ripper of such size must have ample tractor power to operate it



● Peterson extra heavy-duty ripper installed on Cat D9 tractor. This is the ripper which delivers, in conjunction with two very heavy tractors, the ultimate yet obtained in ripping performance and low unit costs for harder rock.

properly, so 640 hp and 170,000 lb. of gross weight were used in a pair of tractors. Even with a \$128,000 investment, and an hourly machine and operator cost of \$60, the expense of preparing a rock cut for subsequent scraper handling was cheap compared with shooting.

One trouble with such a three-some is its lack of maneuverability and certainly there was a waste of investment, material and design efficiency in its 224,000 lb. gross weight package.

Recognizing the clumsiness of this arrangement but also realizing the necessity of its weight for penetration, Peterson Tractor & Equipment Co., San Leandro, California has designed a ripper which offers the same compact efficiency as the standard back-mounted ripper with its superior maneuverability. Too, it has a higher possible concentration of great weight on a single tooth by the use of two tractors when required.

A single shank and tooth is ex-

tended back of the standard down-pressed, back-mounted tractor-ripper. At the extreme back, a shelf-like assembly takes the hydraulically powered, inside mounted bulldozer blade of a second tractor. Thus, jointly acting as a ripper and a pusher, their maximum combined down pressure, concentrated almost above the ripper point, is nearly 60,000 lb. In this grouping, a reduction of some \$17,600 investment results, over that of the giant towed ripper and two tractors. Also, a highly mobile unit is created in which two tractors can be used where necessary.

When tandem power is not required, the ripper on the one tractor is completely self-contained for single use. Further, the new shank and tooth holder is so compact that, retracted, it doesn't impair the full and efficient use of the ripper tractor for other work, such as bulldozing or pushing. A much higher concentration of weight than by any other system is thus possible, to

accomplish harder ripping. The investment is about \$110,400. The full operating weight of two tractors in tandem is 172,000 lb., yet has more down-pressure available for the teeth or tooth than any other known combination, including the 224,000 lb. group previously mentioned.

## RESULT: LOWER COSTS

On very difficult work the two-tractor machine ownership and operating cost including supervision and overhead is estimated at \$55 an hour. While the actual output in broken rock is problematical, there is no reason why 400 to 600 cu. yd. of material an hour should not be well prepared for scraper removal.

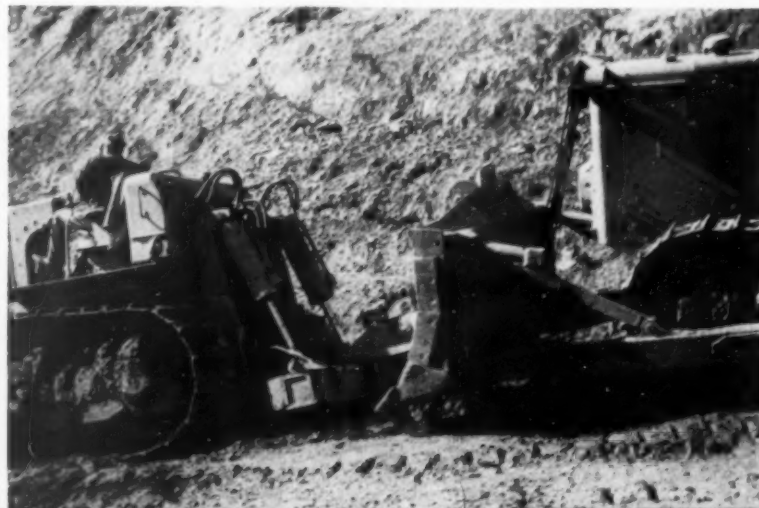
When the work thus done is completed at a cost ranging from 8 or 9 cents a cubic yard to one not in excess of 15 cents, we have taken another long stride forward in the reduction of excavation costs by making scrapers possible for this difficult application.

Along with the increased efficiency of this combination and its lowered costs, a better technique in ripping practice has emerged. It has generally been enough that a tooth could be pulled through the ground. While that was in progress it was hoped that sufficient breakage would occur in the rock to make it acceptable to scraper loading.

Actually, in attempting to rip the harder materials, the common practice has been to sink a long tooth to its maximum depth where possible. Unfortunately the result is generally one in which great blocks or chunks are created rather than fine breakage. Such penetration and

(Continued on page 72)

● New ripper technique with weight of pusher tractor blade assisting in down pressure. About 35,000 lb. of down pressure on one ripper tooth for this equipment combination.



# Diesel down your costs

—with the New

# OLIVER

## OC-4 DIESEL

(gas engine optional)



**LOWEST PRICED  
DIESEL ON  
THE MARKET**



**Only crawler in its class  
to give you diesel advantages!**

Now you have it! Diesel power in a compact, all-purpose crawler—the top-regarded Oliver OC-4. Now you can dieselize your small tractor operations, get dollar-earning economy in those countless jobs where the OC-4 is sized right to do them better...and where it's wasteful to tie up larger rigs.

### See what you get!

- For the first time, modern diesel power in a compact, proved crawler tractor.
- 4-cycle, 130-cubic-inch displacement, 29.5 h.p.\* electric starting diesel—fewer moving parts and therefore less wear, less maintenance. Lower costs all ways!
- Priced low—you can profit from an OC-4 now.
- Deluxe engine features: overhead valves; dry, precision cylinder sleeves; pressurized cooling; simple, single fuel injection pump; two-stage fuel filtering; solenoid starting; precision-balanced rotating parts; effective air cleaner; high-torque performance.
- "Travel-Reverser" transmission—for same speed reversing in any gear setting. (Optional.)
- "Slo-Low" auxiliary transmission—for 50% speed reduction, forward or reverse, in any of the four gear ranges. (Optional.)
- Special loader model designed strictly for loader work. It's faster!
- Also, new gasoline-engine-powered OC-4.
- Mounts job-matched attachments for wide work range.

\* Manufacturer's tests

**See and try the OC-4, diesel or gasoline powered—the lowest priced, full ability crawler of its size!**



## THE OLIVER CORPORATION

Industrial Division

19300 Euclid Avenue, Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

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**ROADS AND STREETS, May, 1958**



**5 men can install  
a drainage structure**

**like this in 2 days!** A big 72" diameter USS AmBridge Sectional Plate Pipe 60' long can be erected on the job and backfilled ready for use in *two days, with a five-man crew* using simple hoisting equipment and standard hand tools. *You just can't build 'em as fast with other materials.*

Another important advantage is that the structure can be used immediately after backfilling. Traffic interruptions are held to a minimum. In some instances, structures can be erected on the bank of a stream and lifted or rolled in.

**No forms needed . . .**

**no breakage!** USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches eliminate the need for forms . . . and, being made of steel, there is no breakage. They are permanent . . . they can be extended whenever a fill or road is widened. Fabricated to meet all federal and state specifications, they are available in a complete range of standard sizes to satisfy the design requirements for any waterway opening.

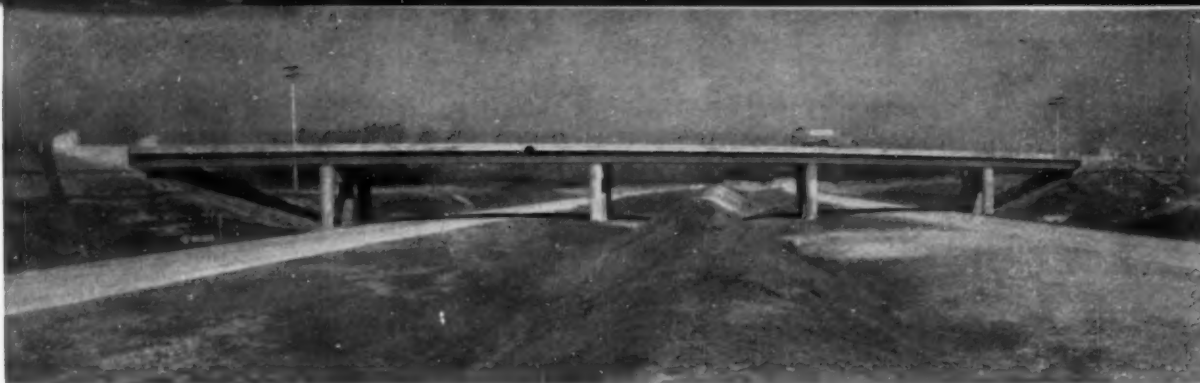
FOR A FREE COPY of our 28-page AmBridge Sectional Plate catalog, write direct to our Pittsburgh office. For information on smaller drainage structures made from USS Galvanized Corrugated Culvert Sheets, please send your inquiry to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh, Pa.



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**Steel bridge erected in 7 working days!** The 320' long Evans Center-Eden Road Bridge on the New York Thruway contains 175 tons of *structural steel* fabricated and erected by American Bridge. Three of its five beam spans are 74'

9 1/8" long. This is another example of the time- and money-saving advantages of building with steel. Steel also saves freight costs and storage space. Steel can be erected in *any* season. Steel can be accurately inspected at any time.



**USS AmBridge I-Beam-Lok saves money** on erection and maintenance. This lightweight, long-life flooring for modern traffic is available in units 6' 2" wide and up to 49' long. With its full 5" depth, it can be applied directly to stringers on spans up to 4' centers to permit H-20 loadings. It does not

require secondary supports. Ease and speed of installation minimize traffic interruptions. Shown here in open-type, it is also available in units ready to be filled with concrete. For detailed information, ask for free copy of 32-page catalog. Covers advantages, specifications and installation.

USS, AmBridge and I-Beam-Lok are registered trademarks

# Bridge helps you for the money!

**American Bridge**  
Division of



**United States Steel**

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## RIPPING . . BEYOND RIPPING

(Continued from page 68)

breakage often results when using a single tooth for hard, impenetrable material without sufficient traction or power to pull through it. The tooth then has to be lifted up and out to clear it, or often rides out to the top of the ground leaving unripped ridges hidden beneath the surface.

In subsequently working through such areas, scrapers load with difficulty or slide out of the ground to the accompaniment of smoke and ground-off or broken cutting edges. Such performance is costly and inefficient to a whole scraper spread where uniform, smaller breakage will result in much lower maintenance as well as improved performance costs.

With this new tandem ripping package, it is possible to attain uniform breakage by maintaining a constant, more efficient and shallower ripping depth. The continuing high force and speed of such work makes the method highly efficient and versatile. The infinite variations of down pressures meet nearly every hardness demand. In-

stead of oft occurring solid ridges under loose top material, controlled, constant, tremendous tooth pressures, though in shallower depths, is ripping more, better and in parallel planes. Under each ripped layer there is a more uniform and solid floor down to which scrapers can be expected to load without the usual difficulty.

The best practice under these conditions, however, is to leave about six inches of loose material above a solid base to cushion tractor movement and to create better traction and travel for the next layer to be broken. Obviously, ripping by this method should be studied until maximum benefits are obtained and good procedure is always understood and practiced.

Here, then, is a new concept in rock breakage destined to decrease costs compared with present methods, and to further reduce impossible of penetration by rippers.

The present-day improvement in rippers is shown to be an outgrowth of performance information and operational necessities gleaned down through the years. These have come from innumerable jobs, analyses, studies and experiments. Cer-

tainly the most important factor in improved design and in performance has been the increase of down-pressure on ripper teeth, coupled of course, with ample tractor power. Ranging from some 7,500 lb. in the 1930s to a maximum now of more than 60,000 lb., the penetration into—and breaking up of—rock has been carried into areas once deemed impossible.

In order to indicate required tractor power in the hardest going, it is necessary to have power in the ratio of one flywheel horsepower to each 90 to 100 lb. of maximum tooth pressure and 2 to 3 pounds of tractor weight for traction. This refers alike through the years to the 1930 tractor, to the intermediate stages, or transitional developments and to the present-day tandem package with its 60,000 lb. of down pressure.

### THE FUTURE?

Where do we go from here? Well, concentrate more weight on a ripper tooth; build it well enough to hold together and take extremely abrasive and costly wear; actuate it with a horsepower for each 100 lb. of down pressure and there is probably no limit.

## NOW, 3 NEW FORD INDUSTRIAL ENGINES . . .

# Up to a MIGHTY 534 cu.in.



Meet the new Ford Super Heavy Duty V-8's . . . built to handle the big jobs easier, at less cost. The most modern in the industry, they feature

new high-turbulence combustion chambers . . . new fuel induction systems . . . new lubrication systems . . . and provide more horsepower per pound of engine weight than ever before possible.

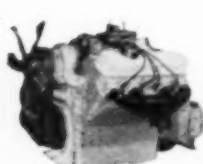
Check Ford's full line of 4-, 6- and V-8 cylinder engines. Most are available as engine assemblies or complete power units, foot- or skid-mounted.



Ford "534" V-8



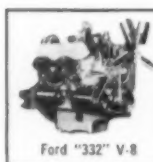
Ford "477" V-8



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YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED



Ford "332" V-8



Ford "272" V-8



Ford "223" 6-cyl.



Ford "172" 4-cyl.



Ford "134" 4-cyl.



Ford "330" Diesel 6-cyl.



Ford "220" Diesel 4-cyl.

### INDUSTRIAL ENGINE DEPARTMENT

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- Large and Growing Structure Market
- A Few States Allow it For Paving

## READY-MIX IN THE HIGHWAY PROGRAM



*Use of truck delivered concrete is booming for highway structures, curb and gutter work, urban streets—but most state highway department engineers continue to prefer pavers to insure uniform high speed placement and mix uniformity on road paving projects.*

*These notes and excerpts in answer to a letter of inquiry by Roads and Streets, will be presented serially. The concluding portion will be published in following issues.*

### A Roads and Streets Round-Up

THE READY-MIXED concrete industry is finding in the expanding highway and street programs a huge and growing market for its product. The "gains" of this industry to date however are chiefly for structural work; except in a few states there has been relatively little paving placed with truck-delivered concrete.

Most states continue to use virtually no ready-mix in pavements, and the engineers have very definite reasons for this decision.

This is the sum-up of questionnaire replies which the *Roads and Streets* editors recently received from the materials engineers of the state highway departments. Of the 32 states (plus D. of C.) represented by detailed replies, 16 report practically no paving with ready-mix; (11) report minor use for projects "too small to use pavers," or for other special conditions; 4 report "considerable" use, ranging from 10 to 20 percent of the pavement yardage; and 2 states specifically report extensive and growing use of truck delivered concrete for pavements.

Some states do not pave with concrete at all, but permit (and expect) use of ready-mix for curbs and gutters, culverts, head walls, and miscellaneous concrete, as well as a large percentage of major highway structure work.

The questionnaire did not touch in any way on local city street practices. Here, of course, ready-mixed concrete has played a prominent part; in some cases, is used 100 percent wherever concrete is specified in the street programs and related im-

provements in city and suburban areas.

One of the most comprehensive efforts to review and appraise the problems of using ready-mix in the road program is that embodied in the excellent paper "Control of Ready-Mixed Concrete," presented at the 42nd Annual Meeting American Association of State Highway Officials, Atlantic City, New Jersey, November 29, 1956, by H. F. Clemmer, engineer of materials, D.C. highway department. The paper was published in *American Highways*, July, 1957. It is a summation of answers received to a questionnaire sent to the 48 states, District of Columbia, Bureau of Public Roads, Hawaii and Puerto Rico.

Readers are also referred to the AASHO's Specification M-157 for Ready-Mixed Concrete, as approved and adopted by the Materials Committee and the member departments of the Association.

● *Missouri—F. V. Reagel, Engineer of Materials:* The following amount of ready-mix concrete have been used in pavements on the Missouri state highway program during the years listed. Additional amounts were used in structures.

1955—23,062 cu. yd. (104,000 sq. yd. or 7.4 miles of 24-ft. equivalent)

1956—13,142 cu. yd. (59,000 sq. yd. or 4.2 miles of 24-ft. equivalent).

1957—30,500 cu. yd. (137,000 sq. yd. or 9.8 miles of 24-ft. equivalent).

These quantities were 6.3, 2.7 and 9.2 percent



## boosts trench production 500%

SPRINGFIELD, N. J. contractors, Ern Construction Co., increased production more than 500% by replacing a backhoe with a Cleveland 110 on 11,000 feet of trenching for 8 and 12-inch pipe, digging 2 feet wide by 5½ feet deep.

"The 110 got us 780 feet of trench per hour where we had been getting only 100-150 feet with the backhoe," reports Ern Foreman Henry J. Appleby. "Our operator got top production with the Cleveland after only 5 days experience at the controls. He was one of our regular work crew and had no previous training as a trencher operator."

Ern also saved 25% on his repaving costs with the narrow, clean accurate trench produced by his Cleveland 110.

## The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO



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respectively of the square yards of pavement placed in the years listed.

We are now specifically prohibiting the delivery of concrete from ready-mix trucks by chute directly onto the subgrade. Contractors must use buckets, buggies or other approved transporting and spreading devices.

The trend will probably be to increase the use of ready-mix because of the convenience and economy to the contractors, especially when only small or moderate quantities of concrete are involved and for all situations where storage and handling room is restricted or nonexistent.

Some controls must be devised for ready-mix if the consumer is to have equal assurance of uniformity and quality as would be demanded and obtained in connection with the use of mixed-on-the-job concrete. The controls to be desired are facilities for testing materials used in specification concrete as distinguished from the "mine-run" of production. The difficulty encountered in this connection is in identifying and controlling those quantities of ingredients which belong to the "specification" concrete, so as to avoid the work and expense of testing all materials used by the plant.

Greater care in maintaining equipment in satisfactory calibration and working order is greatly to be desired, and the problem of segregation due to methods of dumping and placement must be solved.

Difficulty in finishing floors and pavements due to delays and consequent nonuniform deliveries is a major problem, only partially solved by the use of admixtures or retardants.

Specifications are evolving and so continued active cooperation between producers and the engineers should solve most or all of the problems involved. It should be understood that there is still plenty of truth in the plans of one producer—"look what they do to it after we deliver it."

● *Michigan—J. C. Brehlet, Engineer of Materials:* An analysis of eleven 1957 Michigan paving projects, picked at random, showed that about 5 percent of the concrete placed was transit mixed and used principally for curb and gutters, sidewalks, culverts and driveway returns.

Special problems of inspection and testing: variable water contents in individual batches (usually too





**EIMCO 105 DOZER** — Maneuverability + Speed + enough power to move any load = **PROFIT**



**EIMCO 105 EXCAVATOR (Overhead)** — Maximum Crowding force for high capacity excavating + high production loading efficiency = **PROFIT**



**EIMCO 105 FRONT END LOADER** — Rugged construction + Tremendous break-out force + maximum stability for high capacity loads (shown above) = **PROFIT**



View of one section of assembly line.

## HIGH PRODUCTION UNITS

Here is a view you would see any day at Eimco — Dozers, Excavators and Front End Loaders coming down the assembly conveyor line in the big Eimco shops.

Filling repeat orders from users who have learned from experience that Eimco built machines are the high production units designed for really profitable operations.

If costs are eating your profit margins why be hindered with the habit of buying old style tractors.

In the Eimcos you get the quality you pay for as Eimco customers have been doing for almost 75 years.

## THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.  
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa



B 323

high), variable air contents in individual batches (usually too low); time intervals between deliveries of individual batches (extremely variable).

● *Arkansas—E. L. Wales, Engineer of Materials and Tests:* There has been a definite trend toward the use of more ready-mixed concrete during the past few years. In the recent past there were only a few ready-mix plants in our larger cities and now there is a plant in most of

our smaller cities . . . The upward trend in its use has been for structures.

● *North Dakota—Reuben Reich, Materials Engineer:* A recent change in our concrete paving specifications permits the use of slip form pavers by special provision. This operation permits mixing on the site with standard 27E or 34E pavers or central plant mixing. Where central plant mixing is used non-agitating type transport-

ing vehicles may be used.

● *Pennsylvania — F. C. Witkoski, Director of Research:* In 1956 our state road program used 545,000 cu. yd. of ready-mixed concrete, of the 1,800,000 cu. yd. produced by the industry in the state for all purposes.

The general trend has been an increase in ready-mixed concrete for paving purposes in cities.

Our department maintains an approved list which is revised bi-annually and at these periods all plants and trucks are reinspected by the district construction, maintenance and materials engineers as a team. All deficiencies and required corrections are reported. Each producer is notified to have these corrections made within 60 days following which final inspection is made. Failure to comply at this date results in automatic removal from the approved list.

The greatest problem seems to be volume requirements of the transit mixers or agitator trucks as advocated by the National Ready Mixed Concrete Association and the Truck Mixers Manufacturers Bureau. Although the department is at present revising the present Specification Form 408 (1954), the latest proposed by the two bodies have not been accepted.

### Ready-Mix Terminology

As defined by the Delaware state highway department's specifications:

*Central Mix Concrete*—Batched and mixed at a central point and delivered to the project in agitator trucks.

*Truck Mix Concrete*—Batched but not mixed until arrival to the project.

*Transit Mix Concrete*—Because of lack of control, our specifications do not permit.

Quoting Stanley S. Scarborough, testing engineer, "We have felt for a number of years that Central Mix and Truck Mix Concrete have a definite and important part in pavement and structure construction and have been using both types for several years.

"Last year of the total cubic yards of portland cement concrete, 38 percent of our concrete was central mix and 8 percent was truck mix."

*Additional comments by state highway department materials engineers will be presented in a forthcoming issue.*



## LIMA Roadpacker speeds freeway construction near Colfax, California

Proper consolidation plays a large part in the speed with which McCammon-Wunderlich Co. and Wunderlich Contracting Co., Palo Alto, California, are completing their \$3,650,000 state freeway contract on U.S. 40 east of Colfax.

These prominent contractors have been using the Lima Roadpacker, a big favorite for highway and airport construction throughout the country. It has no equal for fast, uniform consolidation by the vibratory method of single course macadam bases, gravel subbases and soil-cement bases.

The Roadpacker is equipped with six

420-lb. hydraulically driven shoes for effective vibrating and tamping action. These oscillate approximately  $\frac{1}{4}$  in. at the right frequency for best consolidation of any base material. The force is applied vertically to prevent shoving the material being stabilized. The sole plate is designed for both forward and backward operation.

Working widths, easily varied by up-folding one or both of the end shoes, range from 8 ft., 9 in., with four shoes, to 13 ft., 1 in., with six shoes. The shoes are raised and lowered hydraulically.

*Get all the facts on the Lima Roadpacker—write today for your copy of the Roadpacker bulletin.*

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division, Lima, Ohio  
BALDWIN · LIMA · HAMILTON  
Shovels · Cranes · Draglines · Pushshovels · Roadpackers · Crushing, Screening and Washing Equipment

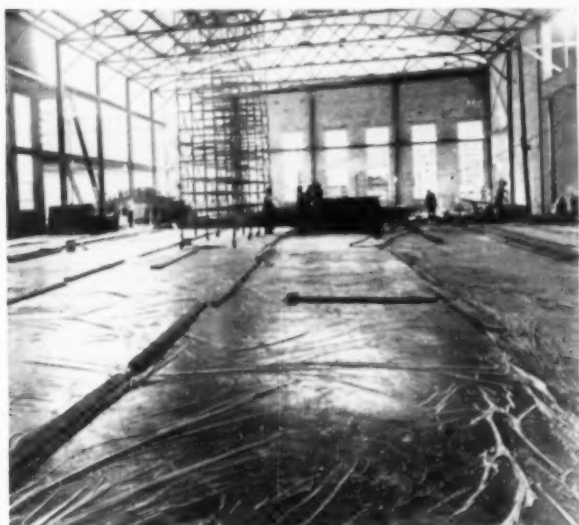


... for more details circle 243 on enclosed return postal card

# A BETTER CURE FOR CONCRETE PROBLEMS



FOR ECONOMICAL TILT-UP CONSTRUCTION: BOND-BREAKER CURING BLANKETS OF "VISQUEEN" FILM give these added advantages: (1) Stronger cures, (2) Each section comes away easily—leaves surface clean and smooth.



FOR SLAB FLOOR: CURING BLANKETS OF "VISQUEEN" FILM give you these added advantages: (1) Slow, even, stronger cures, (2) No watering needed. You save time, labor, (3) Film stays light, is re-usable.



FOR ROAD CONSTRUCTION: CURING BLANKETS OF "VISQUEEN" FILM give you these added advantages: (1) Core test strengths prove stronger cures with greater economy, (2) Low first cost—plus up to 23 re-uses cut blanket cost to fraction of cent/sq. ft., (3) Light weight saves labor. No watering necessary. Film rolls up easily.

**Needs No Special Handling or Drying. Will Not Rot, Mildew. Inert—No Chemical Reactions With Concrete. White Opaque Film (reflects heat) Comes in Wide Range of Widths Including 14' Rolls With No Folds and Seamless Widths Up To 32'. Write Now—or Use Information Request Tag For Details.**



**VISQUEEN** film—the first and foremost polyethylene film. A product of the long experience and outstanding research of **VISKING COMPANY** Division of **UNION CARBIDE** Corporation. P.O. Box 1410, Terre Haute, Indiana. In Canada: **VISKING COMPANY DIVISION OF UNION CARBIDE CANADA LIMITED**, Lindsay, Ontario. **VISQUEEN** and **VISKING** are registered trademarks of Union Carbide Corporation.



# As the trucks go...

## only MACKS give you all this

• Widest range of heavy-duty truck and tractor chassis for construction and road-building (dumpers, concrete mixer models, flat-bed trucks, carry-alls). Four- and six-wheel models.

• Full range of off-highway dumpers . . . from 4-wheelers with a 15-ton rated capacity up to 6-wheelers with a 34-ton rated capacity.

• Wide Mack power options — diesel and gasoline engines — 150 h.p. on up to 400 h.p.

• Famous Mack transmissions from 5- to 20-speed, with option of torque converter on the larger units.

• Planetary gear reduction in rear-axle wheel hubs of larger

vehicles for smooth power transfer without excessively large gears in the carrier.

• Six-wheelers offer exclusive Mack Balanced Bogie with Power Divider — the flexible, four-wheel, rear-axle drive that delivers maximum power to the wheels with traction for extra work-hours.

• Rugged, high-tensile frames that give the utmost in structural stamina . . . heavy-duty axles and suspensions that make light of the heaviest loads over the roughest roadways.

• Models available — at once — from stock . . . or models "customer assembled" from standard Mack components. Option of power steering, power brakes, power clutch.







# so goes the job!

You know that truck cycle time is the key to profits on any job. You know that the best equipment in the world—cranes, shovels, pavers—just gobble up earnings if they're sitting around waiting for the trucks to arrive.

And you know that you can't match Macks for the guts and go that keep your equipment humming! You know that Macks—with their extra strength and stamina—can pace the entire operation for months on end without interruption. With Macks—you know!—

You know because Macks have the power, traction and stamina to haul up the steepest grades and through the most slippery going... because Macks take 10-, 20-, or 30-ton loads in three or four passes... because you can always depend on a Mack!

So why not get the most out of all your equipment? Why risk ruinous delays? Why keep idle standby trucks when—with Macks—standby units

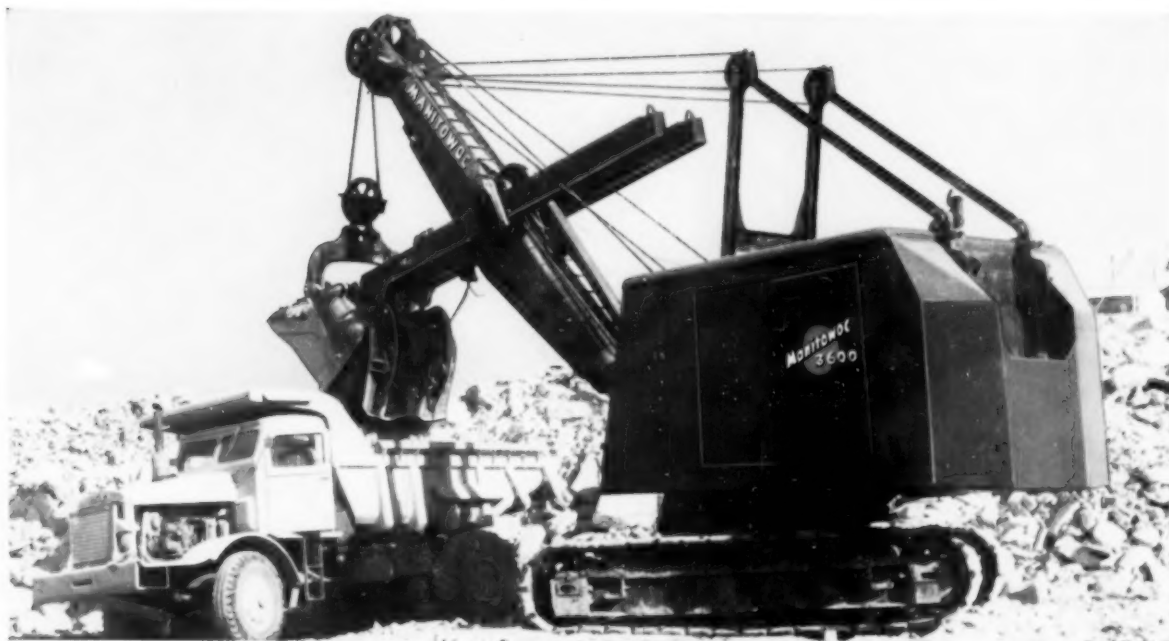
are a needless precaution. Why not cash in on the experience of seasoned contractors who'll tell you that two Macks can outwork, outlast and outearn three or more competitive units of equal capacity on rugged jobs. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

**It's part of the language**

**...built like a MACK**



# Mack



announcing  
the new  
Manitowoc  
model 3600  
**3** yard  
shovel

**ENGINEERED TO MATCH  
TODAY'S BIGGER HAUL UNITS**

**Manitowoc**

**The new 3-yard 3600 is scientifically engineered to match modern haul units.** New, high-sided hauling units require a shovel with the correct shipper shaft positioning . . . the exact dipper pitch and shape to provide higher reach, cleaner dumps, faster loading.

**The new 3-yard 3600 delivers full power to the dipper.** Simple design eliminates power loss in the gear train . . . increases cycle speed. And for smoother power transfer the torque converter system includes a "governor" to maintain rigid control of the infinite number of power ratios . . . line pull and line speed factors are balanced against load resistance.

**The new 3-yard 3600 makes hard jobs easy.** Responsive air controls, smooth-acting clutches and positive-action brakes increase operator efficiency even on the toughest jobs.

**The new 3-yard 3600 stays on the job longer.** Box-section dipper sticks; a massive shipper shaft; a tubular boom; and a manganese dipper are among the long-life features that keep the 3600 working longer without downtime.

**The new 3-yard 3600 is quickly convertible to crane, clamshell or dragline operation.** Available as a 65 ton capacity crane and 3-yd. dragline. Simple boom connections assure fast field conversion.

**See your Manitowoc distributor now for more facts on the new 3-yard 3600.** There are dozens of other profitable features to help you land more contracts. Get more information *today!*

**MANITOWOC ENGINEERING CORP., Manitowoc, Wisconsin**  
A SUBSIDIARY OF THE MANITOWOC COMPANY, INC.

**MANITOWOC ENGINEERING CORP.**

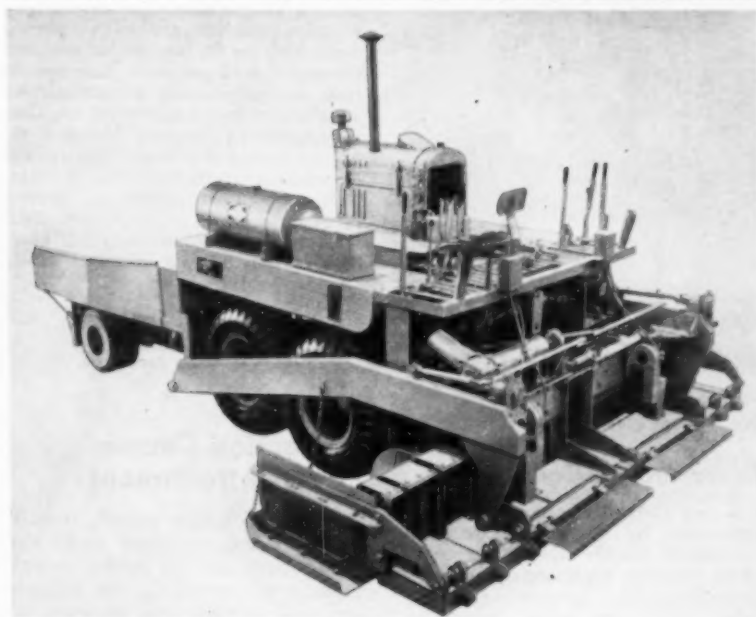
**MANITOWOC, WISCONSIN**

<b>CRANES</b>	<b>SHOVELS</b>	<b>DRAGLINES</b>	<b>TRENCH HOES</b>
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

. . . for more details circle 303 on enclosed return postal card

## New Products

Reader Service Numbers on Enclosed Postal Card



Blaw-Knox 10-ton Capacity Express Paver

### Bituminous Finisher

A new automatic bituminous paver-finisher announced by Blaw-Knox, is claimed to offer lower maintenance, improved quality of mat, easier operation and less adjustment time. The new 10-ton capacity unit, which practically eliminates manual operation, has been named the "Express Paver."

All advantages of the earlier PF-90 paver have been retained. Principal changes center on the screed, augers, tamper, and optional air equipment. Tamper frames are more ruggedly constructed; horizontal tamping surface has been increased; a single tamper drive—one that is entirely new—promotes easier maintenance, and eliminates synchronization problems and chain drive. An improved abrasion resistant "T-1" steel screed, with longer life, provides smoother finishing, surface continuity, easier positive and negative crown adjustment, greater compaction and uniform density. Two new independent screed heaters provide more even heat distribution.

Blaw-Knox Co., Construction Equipment Division, Mattoon, Ill.

For more details circle 101 on Enclosed Return Postal Card.

### Giant Loader

Reports from various contractors on the Kolman Model 303 loader include such items as the following—elimination of 75% of the equipment originally estimated for their

job; 19-yard scrapers loaded in 17 or 18 seconds with material weighing 3,300 lb. per cu. yd. This required a belt flow of 5,900 tph.; 10,000 yds. handled in 8 hours using 12 scrapers on a haul of approximately  $\frac{1}{2}$  mile; boulders weighing over 1,000 lb. included in material handled; savings of more than 50% on scraper maintenance as compared with push-loading. The 303 is a trap and tunnel feed loader, 50 ft. long, with tail section extending 29 ft. ahead of tail plate, operating with a 60-in. belt, and requiring approximately 100 hp. Operator's station the head pulley gives him a complete view of all operations.

Kolman Manufacturing Co., Sioux Falls, South Dakota

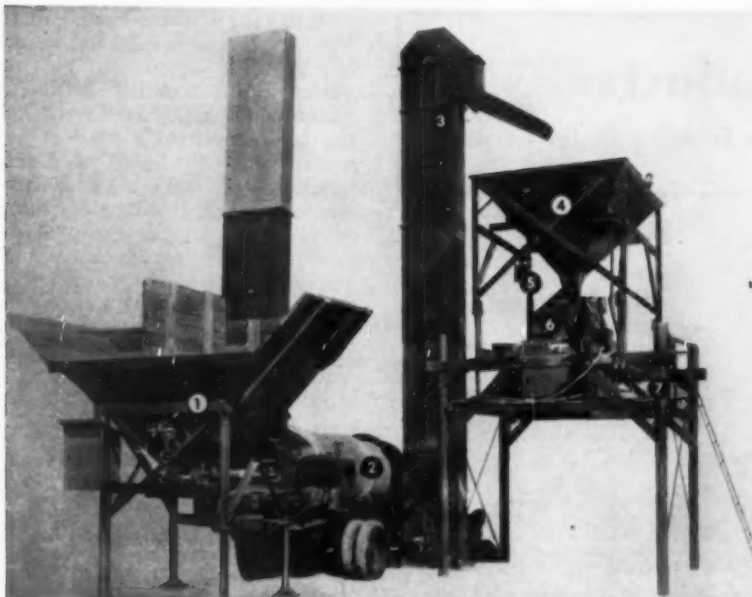
For more details circle 102 on Enclosed Return Postal Card.

### 30-Ton Asphalt Plant

A new portable asphalt plant with a rated capacity of 30 tons per hour has been announced by Littleford Bros., Inc. Its features are 5-ton dual feeder bin proportions and feeds aggregate directly into dryer; 30-ton rotating dryer made of heat resistant Cor-Ten steel. Economical counterflow burner system. Even-veil lifting flights give most efficient drying action available; Enclosed hot elevator delivers continuous cascade of aggregate; 5-ton storage hopper holds and discharges aggregate as required; 1000-lb batching hopper; 1100-lb twin-shaft type pug-mill with precision type steel wear plates, chrome molybdenum steel tipped paddles. Thoroughly mixes and dumps half-ton batch every 60 seconds; Self-elevating platform per-



Kolman 303 Loader at Work



Littleford 30 Ton Portable Asphalt Plant

mits discharging of bituminous concrete directly into trucks.

Littleford Bros., Inc., Dept. PR-1 499  
2 Pearl St., Cincinnati 2, O.

For more details circle 103 on  
Enclosed Return Postal Card.

### Radio Traffic Control

A new radio traffic control system, announced by Motorola, provides a compatible, flexible and reliable method of centrally coordinating and synchronizing traffic lights through utilization of the most recent advances in

electronics.

By radio transmission of tones, the system controls standard local control functions such as dial selection, offset selection, offset synchronization and any other special light conditions which the local controller is capable of instituting. The system works from a central programmer, which may vary from a simple clock-type device to a complex punched card or tape system, depending on the number of program changes desired per week. Information from the programmer is translated by a coder into tone codes which are then transmitted by standard Motorola radio equipment to FM receivers at each intersection. Here, a decoder re-translates the tones to initiate the desired program set up in the local controller.

Motorola Communications and Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.

For more details circle 104 on  
Enclosed Return Postal Card.

### Correction Course Paver Attachment

The device here shown, consisting of extension arms from the screed back to the rollers which support the screed on the already corrected surface, was designed to

**More GIANT Sizes! More GIANT Tread Designs! More GIANT Savings!**  
**Now at SOUTHERN TIRE COMPANY!**



Probably more dirt and rock is hauled on Southern Tire retreads than on any other retreaded tires. That's because more and more contractors and heavy equipment operators are discovering the superior quality and economy of Southern Tire retreads.

Southern Tire offers not only the country's most complete range of tire sizes and tread designs, but also the world's finest retreading facilities—three-sectional molds that mean no buffing to breaker strips regardless of growth.

These facilities and use of finest tread rubber, plus Southern Tire's long experience, assure better quality with greater economy. Call your tire dealer now for facts about how Southern Tire retreads can save you as much as 40% of the price of new tires yet give you guaranteed new tire service.

● All sizes—from 1100 x 24 to 33.5 x 33



**SOUTHERN  
TIRE COMPANY**

1414 Broadway  
SHEFFIELD, ALA.

Phone Collect  
EV 3-3312

... for more details circle 321 on enclosed return postal card



# He tested them all

## ... then bought an Allis-Chalmers HD-6G tractor shovel



**Don Nourse**, a leading swimming pool contractor, rented tractor shovels until he found one that appealed to his operators, his sales force and company officials. Choice of all concerned—the HD-6G.



**HD-6G**  
72 net hp  
1½-yd bucket  
19,600 lb

A heaping 1½-yd bucket comes out of the excavation for a 25 x 60-ft pool. There was time before lunch to start work on a wading pool.

**Look ahead...move ahead**  
**...and stay ahead with**

# ALLIS-CHALMERS

### Here's why the HD-6G is everybody's favorite at Fiesta

**Talk first with Don Nourse**, President of Fiesta Pools, Southgate, California, to find how the Allis-Chalmers HD-6G came to be selected as Number 1 production machine. Don's company is the nation's second largest swimming pool builder. Don tells how Fiesta rented tractors before buying their own unit. After trying them all, he's convinced there is nothing available to touch the HD-6G for excavating pools.

**Jack Sweitzer runs the HD-6G** And he's convinced it's the best machine he's ever been on. Jack now digs an average of two pools a day—and that's *double* the capacity of any excavating equipment they used in the past.

**Roy M. Pederson**, Vice-President responsible for sales at Fiesta, will tell you their new HD-6G has already added to company sales volume because of its ability to increase production.

**Robert E. Franks**, Vice-President and Production Manager, says their HD-6G is the first of several purchases of Allis-Chalmers machines. In his opinion, it has proved itself a great asset on their type of operation.

If you're not already using an Allis-Chalmers tractor shovel, you'll be convinced the HD-6G can do the best job for you when your dealer shows you one—in *action—on your job*. Call him today! Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



... for more details circle 235 on enclosed return postal card

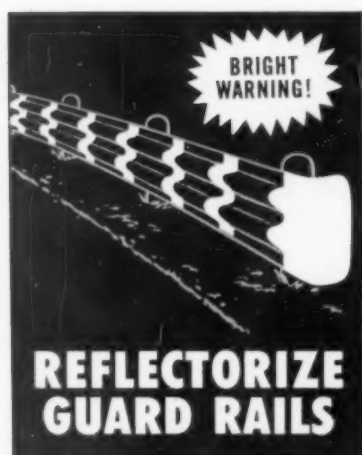


**Blaw-Knox Special Attachment on a Difficult Resurfacing Job**

meet unusually exacting correction course specifications on extensive dual lane resurfacing near Bloomington, Ill. The "Bituminous PF-90" with which it was used is fully acceptable under ordinary conditions, but was regarded as inadequate for the badly deteriorated surfaces presented by this case.

Blaw-Knox Company, 300 Sixth Ave., Pittsburgh 22, Pa.

For more details circle 105 on Enclosed Return Postal Card.



**... FOR 17¢ A SQUARE FOOT**

"Codit" Reflective Liquid goes on fast by brush or spray. Hazards flash their own bright warning at night for safety. Reflectivity lasts up to 2 years. Buy your supply from your 3M Representative or write 3M Company, Dept. NR-58, St. Paul 6, Minnesota.



Get Codit Reflective Liquid in 6 oz. aerosol spray, 5 lb. can, or in complete safety kit.



For more details circle 304 on enclosed return postal card.

A small portable plant, the "Batch-A-Bout," announced by The Noble Co., permits economical site batching on projects too small to warrant setting up a full capacity concrete plant.

Essentially it is an aggregate weigh batcher, transfer conveyor, and sack cement loading hopper, to which a 40-ton aggregate storage bin and other necessary items can be added to provide for larger jobs.

The Noble Co., 1860 Seventh St., Oakland, Calif.

For more details circle 106 on Enclosed Return Postal Card.

## Spreader Attachment

A new blacktop spreader attachment, designed exclusively for Models HU,

## Small Batching Plant



**"Batch-A-Bout" Portable Concrete Batching Plant**



**Blacktop Spreader Attachment for "Payloader"**

# Successful bidder on 19 earth-fill dams

"Our Allis-Chalmers equipment has proved it can move more dirt at low cost ... and let us be low bidder time after time. It gets a full share of credit for our success," says **Joe Duncan** of Arnett & Duncan, Corsicana, Texas.



TS-360 motor scrapers (15 yd struck; 20 yd heaped), like that shown at the left, are the big guns of the Arnett & Duncan fleet on earth-fill dam construction. Working with the TS-260's (11 yd struck; 14 yd heaped), they help make a high-production, low cost-per-yard team.

## 7,000 cu yd per day

... that's the kind of earth-moving production Arnett & Duncan get from their spread of Allis-Chalmers motor scrapers and crawler tractors.

Working on 1,000 to 1,200-ft hauls, the TS-360 and TS-260 motor scrapers are loading, hauling and dumping tough-to-handle waxy clay with 30 percent sand on a bed of shale. Even in this rough material, which normally slows down production, the Allis-Chalmers units have been cutting cycle time. The curved bowl bottom with offset cutting edge brings a real boost to loading cycles. Incoming dirt breaks up and rolls into the bowl, filling it with heaped loads ... faster.

## Lower cost per yard

Joe Duncan reports that his Allis-Chalmers equipment can dig, haul and place dirt for a lower-per-yard cost ... move as much dirt as higher-rated capacity units.

"Our operators like our Allis-Chalmers equipment, too, because of the operating ease, riding comfort. You get a lot more production when the crew likes the equipment," adds owner Duncan.

Find out for yourself how productive Allis-Chalmers construction machinery can help improve your profit picture on a wide range of land improvement work. Ask for all the facts—and a working demonstration of real dirt-moving efficiency. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



**Look ahead...move ahead  
...and stay ahead with**

# ALLIS-CHALMERS

... for more details circle 235 on enclosed return postal card

HH and HO "Payloader" tractor-shovels is front-mounted and interchangeable with bucket. It lays down hot or cold mix asphalt in strips up to 8 ft wide and 6 in thick in a single pass. All spreader operations are hydraulically controlled.

Features include 2-cu. yd. capacity hopper, independent suspension on 4 pneumatic tires, and a separate air-cooled gas engine that provides pressure for the hydraulic motor which drives the twin 8-in. diameter augers and all hydraulic control cylinders.

The Frank G. Hough Co., 768 Seventh Avenue, Libertyville, Ill.

For more details circle 107 on Enclosed Return Postal Card.



Top Unit: 50-Watt T-Power Radio  
Lower Unit: 100-Watt Model

## 2-Way Mobile Radio

A new 100-watt mobile radio with transistorized power supply has been announced by Motorola. Transistor-powered radios placed on the market by Motorola in mid 1957 were 20-25 watt sets. The new "T-Power" equipment now available includes 60-watt radiophones in the 144-174 MC. band and 50 and 100 watt units in the 25-54 MC. band. Four transistors are used in the 100-watt radio to replace both the vibrator and the dynamotor.

Motorola Communications & Electronics, Inc., Dept. T, 4501 Augusta Blvd., Chicago 51, Ill.

For more details circle 108 on Enclosed Return Postal Card.

## Motor-in-Head Vibrator

A rugged 60-cycle motor-in-head vibrator has been put on the market by Stow Manufacturing Co. The model YU consists of a 2½-in. vibrator head with a universal motor; a casing which acts as a handle; a completely covered off-on switch 7 ft. from the head; and a 25-ft. electric cable that plugs into regular AC or DC 115 volt current. It is available in casing lengths of 7, 14, or 21 ft. Heart of the YU is the vibrator head which is completely sealed.



Model YU Vibrator

Vibration rate is 12,000 to 15,000 per minute. Thermal overload protection shuts off the motor in case of destructive heat or overload.

Stow Manufacturing Co., 65 Shean St., Binghamton, New York.

For more details circle 109 on Enclosed Return Postal Card.

(Continued on page 90)



**"Our hammer mill proved it—**

**Only Colmonoy No. 1 hard-facing  
lasts so long, costs so little!"**

Colmonoy No. 1 hard-facing stands up under rough conditions involving impact and abrasion. Its cost is moderate and it welds easily. Great on equipment like dozer blades, shovel teeth, crusher rolls, and conveyor parts.

The new low-hydrogen coating provides excellent arc stability and makes weld cleaning between successive passes unnecessary. You can use it on vertical surfaces, too. Colmonoy No. 1 deposits are hard: 58 to 63 Rockwell C.

Write today for more information about Colmonoy No. 1 and the rest of the Colmonoy line of hard-facing alloys.

**HARD-FACING ALLOYS**

**WALL COLMONOY** DETROIT 3, MICHIGAN

BIRMINGHAM • BUFFALO • CHICAGO • HOUSTON • LOS ANGELES  
MORRISVILLE, PA. • NEW YORK • PITTSBURGH • MONTREAL • GREAT BRITAIN

Available as ⅛, ⅜, and ½-inch diameter electrodes (DC), in 10 and 50 lb. metal containers.



... for more details circle 335 on enclosed return postal card



## Tough road duty tests operator and machine

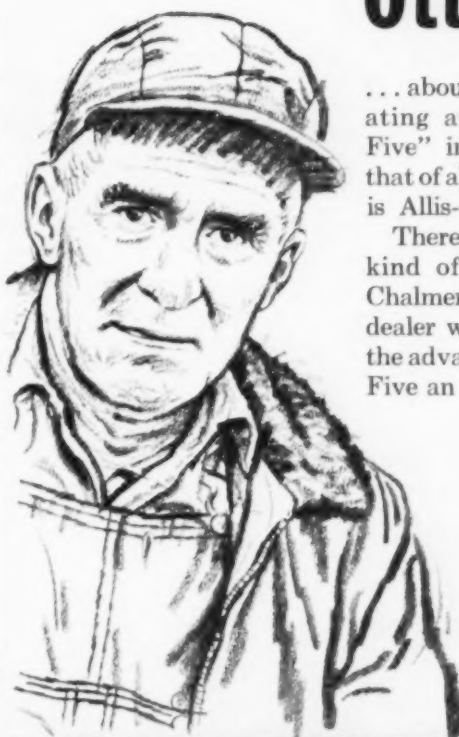
**Otto Nikoley, Alta, Iowa,** works full time maintaining roads.

**Eight months a year,** he and the Allis-Chalmers Forty Five motor grader work a program of finishing dirt and gravel roads. An average of three passes is all that's required to finish most of his jobs. During winter months, the grader is still productive. Equipped with snowplow, the machine is busy keeping roads open and traffic on the move.

**Otto and the Forty Five work well together.** There's plenty of power at hand to do the job. The Forty Five is easy operating, too. The platform is roomy and the deck is clear. Visibility is excellent all around, sitting or standing. And the blade's controls can't kick back. When Otto moves the lever, toggle engages or releases clutches surely, without wrist-snapping backlash.



**Put your men** on Allis-Chalmers motor graders . . . preferred by more operators, bought by more owners every year. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



## Ask Operator Otto Nikoley

... about motor graders. He's operating an Allis-Chalmers "Forty Five" in Iowa. Otto will tell you that of all types of graders, his choice is Allis-Chalmers every time.

There are good reasons for this kind of enthusiasm. Your Allis-Chalmers construction machinery dealer will be glad to demonstrate the advantages that make the Forty Five an operator's favorite.



### FORTY FIVE

120 brake hp • 6 speeds forward • 3 speeds reverse • 23,800 lb



**Look ahead...move ahead  
...and stay ahead with**

# ALLIS-CHALMERS

... for more details circle 235 on enclosed return postal card

**ROADS AND STREETS, May, 1958**

# Heltzel Flex-Plane



UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batchers and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

**THE HELTZEL STEEL FORM AND IRON**

FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.

# Engineering



**brings you unitized batching, improved forms and a new way to finish concrete**

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast*.

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.



**COMPANY • Warren, Ohio**



. . . for more details circle 277 on enclosed return postal card  
**ROADS AND STREETS, May, 1958**



## NOW...a quality 12-ton low-bed for less than \$2000\*!

Here, at last, is a *special* 12-ton capacity low-bed trailer, engineered and built by LaCrosse, to provide *maximum strength and long life with minimum investment*. Using two rugged main beams and full-length outer channels as load-carrying members, the new LaCrosse DFS-12 has an 8' x 14' oak deck platform, and a 2' beavertail to simplify rear loading.

Trailer comes fully equipped with four 8.25x15 14-ply tires, ICC

lights, reflectors and 6 lash rings. In addition, you get the same husky 12 $\frac{1}{4}$ " x 6" S-cam brakes used on all standard LaCrosse low-beds—and proved by tests to be the safest, *smoothest-running brakes on 15" wheels*.

So why gamble with unknown, "make-shift" trailers—just to save money—when you can get this quality-built LaCrosse DFS-12—*PLUS a one-year warranty*—at no extra cost.

\*Plus taxes, FOB LaCrosse, Wis. (Subject to change)

Mail for more facts

**LaCROSSE TRAILER CORP., Dept. E115, LaCrosse, Wis.**

Tell me more about LaCrosse Trailers (..... 12-ton capacity)

- ☐ Std. Low-Bed      ☐ Tilt-Type      ☐ Removable Gooseneck  
☐ Send name of nearest LaCrosse Trailer Distributor

Name ..... Title .....

Employed by .....

Address .....

City ..... State .....

LC-49

Heavy  
metal  
fabrication  
since  
1865

**LaCROSSE**

... the low-bed backed by a 1-year warranty

... for more details circle 293 on enclosed return postal card

90

## New Products

(Continued from page 86)

### Torque Wrenches

Torque capacity of OTC torque wrenches can be doubled with new extensions which double the length of wrenches manufactured. The new extensions are made up of two pieces: A tubular steel adapter arm with a square



Extension for OTC Torque Wrench

opening to fit the torque-wrench drive and one of the many drive-end accessories—box wrenches, 15 degrees and double-offset wrenches, ratchet and fixed  $\frac{3}{4}$ , 1 and 1 $\frac{1}{2}$ -in. drives. The drive end can be quickly fitted or replaced on the tubular arm in a few seconds.

Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.

For more details circle 110 on Enclosed Return Postal Card.

### Improved Luminares

Announcements from General Electric Co's Outdoor Lighting Department at Hendersonville, N. C. describe a new 400-watt mercury vapor luminaire with an extraordinarily durable acrylic refractor—resistant to the thermal shock of cold rain or to sudden changes from as low as -20° F to operating temperatures; to impact; to damage by blowing sand, smoke, fumes, or salt spray; and to breakage during installation or maintenance. The unit is designated "Form 400C".

Also introduced is what is believed to be the most powerful fluorescent street and highway luminaire currently available—a unit with six 6-ft "Power Groove" lamps, generating 55,800 lumens. A system of recirculating fans and centrifugal blowers controls internal temperature.

Fan-cooling is responsible also for the 46,500-lumen output of the new 4-lamp luminaire—a 25% increase over the 1957 "Power Groove" lamps, and more than double the 21,200 lumens of 1956.

General Electric Company, Schenectady 5, N. Y.

For more details circle 111 on Enclosed Return Postal Card.

ROADS AND STREETS, May, 1958





## The A-W Hydraulic Crane... most versatile piece of equipment

according to D. R. Smalley & Sons, Inc., Celina, Ohio

D. R. Smalley & Sons, Inc., is a major Ohio road and excavating contractor. The company is now engaged in relocating a section of U. S. 40 north of Dayton. The project, entailing 1,400,000 yards of cut and fill and 20 miles of 2-lane pavement, is estimated to cost \$4,800,000.

**Francis Smalley tells us:** "In 1955 we decided to buy an A-W Hydraulic Crane to assist with the maintenance work on our heavy construction equip-

ment. It quickly proved its value on such jobs as changing transmissions on trucks and tractors and for lifting out and transporting engines to the shop for overhaul. It is also useful for removing crawler tracks and roller frames from tractors.

"We find many other uses, too, for this highly mobile unit. Loading and unloading materials such as barrels of fuel oil, curing compounds, and air entraining agents. In addition, we have

found it very effective for laying reinforced concrete tile of up to 24-inch diameter.

"The A-W, in our opinion, is an exceptionally handy tool—our most versatile piece of equipment. Any contractor who does his own maintenance work will find dozens of jobs for it to do."

Find out how the A-W Hydraulic Crane can help you reduce downtime and build profits. See your nearby A-W distributor or write us.

... for more details circle 238 on enclosed return postal card

### Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

**BALDWIN · LIMA · HAMILTON**

Power graders • Motor sweepers • Road rollers • Hydraulic cranes





New 450-460 MC Base Station for Mobile 2-way Radio System

### Radio Base Station

A new radio base station announced by Motorola, incorporates a 250-watt transmitter and a highly sensitive receiver to extend range of two-way mobile radio systems operating in the 450-460 megacycle band. The high power transmitter of the new equipment, used with a high gain antenna, provides effective radiated power of more than two kilowatts. This will normally double the range and so quadruple the area covered by the low power transmitters presently available for use in this band. The receiver of the new station features tripled sensitivity.

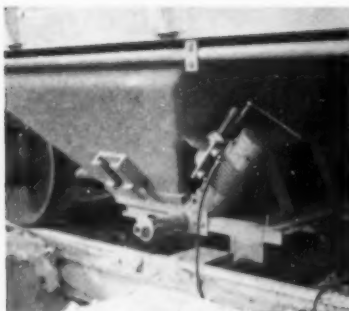
One of the first regular authorizations to employ high powered equipment in the 450-460 MC band was granted to the Lake County, Illinois, Highway Department on March 6, 1958.

Motorola, Inc., Communications and Industrial Electronics Division, 4501 West Augusta Boulevard, Chicago 51, Ill.

For more details circle 112 on Enclosed Return Postal Card.

### Electric Vibrator

A new electric vibrator designed to speed the unloading of dry cement, sand and other types of powdered granular materials, introduced by Engineered Equipment, Inc., utilizes the rotary eccentric. The "Vibramat" can be attached to the unloading hopper of railroad freight cars or other transporting equipment. It sets up a concentrated vibration alleviating the need for sledge-hammer pounding to loosen jammed or packed materials. When used on concrete forms, it is stated to cause the wet concrete to settle smoothly into the form without hand rodding or pounding. The "Vibramat" is available with either a rigid or swing-



"Vibramat" Attached to Hopper

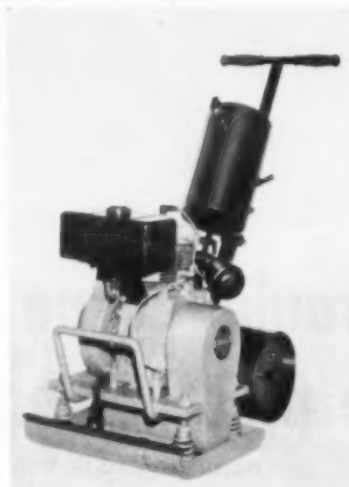
ing base and with  $\frac{1}{8}$ -hp,  $\frac{1}{2}$ -hp or 1-hp motor.

Engineered Equipment, Inc., Waterloo, Ia.

For more details circle 113 on Enclosed Return Postal Card.

### Water Film Aids Compactor

A new water feed attachment for use on "Power-Pactor" self-powered vibrator-compactor when compacting blacktop has been announced by Maginnis Power Tool Co.



Water Feeder on "Power-Pactor"

The attachment supplies a film of water which flows down and coats the face of the compacting plate, effectively preventing asphalt adhesion and assuring a smooth, uniform finished surface, the manufacturer states. The flow is value-controlled. One filling of the tank is claimed to be sufficient for two hours' operation.

Maginnis Power Tool Co., 154 Distil Ave., Mansfield, O.

For more details circle 114 on Enclosed Return Postal Card.

### Eight New Tandems

The new "C" Series of Reo tandems for 1958 includes eight base models with GVWs ranging from 35,000 to 52,000 lb.

Built for rugged jobs, the series incorporates many features for improved performance, accessibility and maintenance, among them: Smooth contour fenders divorced from the cab; Over-size grill and radiator for maximum cooling; Flat-top fenders and center-hinged hood for easy engine accessibility; One piece curved windshield for uninterrupted vision; Large running boards of non-skid deck plate; Three-rib, high strength bumper extending the full width of fenders; Dual headlights; A front-of-bumper to back-of-cab dimension of only 102½ in. for greater payload.



Reo "C" Series Tandem

Included in Reo's tandem line are five gasoline-powered 6 x 4's, one gasoline 6 x 6, and two 6 x 4 diesel units.

Reo Division, The White Motor Co., Lansing, Mich.

For more details circle 115 on Enclosed Return Postal Card.

### Brick Grease

"Keystone No. 42" high-lubricity brick grease for open-well, top-feed bearings is announced as a product which lubricates properly without need for either processing to frictional heat. It has a working range from 0 to 175 degrees F and a melting point of 290 degrees F. Its surface film is very oily and, when the brick is properly installed, provides even, ample lubrication without waste or drizzle.

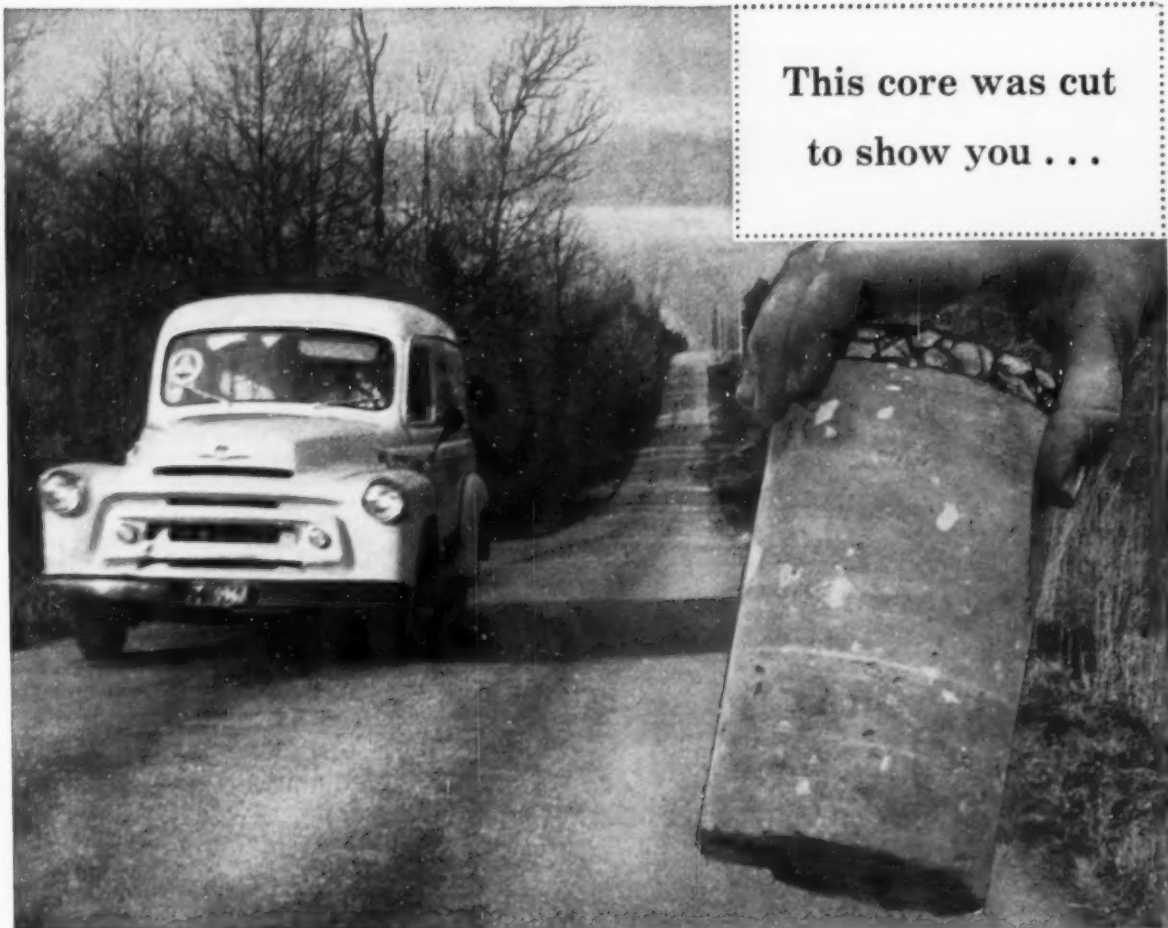
Keystone Lubricating Co., 3100 N. 21st St., Philadelphia 32, Pa.

For more details circle 116 on Enclosed Return Postal Card.

### Tractor and Loader

The heavy-duty "Work Bull 500" loader on the "Work Bull 303" tractor provides a medium-capacity tractor shovel-loader combination, designed by the Massey-Ferguson Industrial Division. Because the loader attaches directly to the tractor and the pump mounting is built-in, no front bumper is required so the unit can move in closer to trucks.

The "Work Bull 500" loader  $\frac{3}{4}$ -cu. yd. truck capacity bucket features a



This core was cut  
to show you . . .

*88% stronger today! In 1958 a core cut from this road by a commercial laboratory tested 849 psi. Strength 11 years ago was 452 psi. Twelve per cent cement was used with a silty-clay soil.*

## 11 years in use on this Madison County, Tennessee, road ...soil-cement pavement grows stronger year by year!

Core tests prove it on roads everywhere. Soil-cement is stronger inch for inch than any other paving material short of concrete.

Here's one low-cost pavement that actually grows stronger with age. It has beam strength, too. It spreads the load over the subgrade. You'll never have potholes, washboarding or soft spots with soil-cement roads. Maintenance costs stay low.

And first cost is low, too! (In most cases 75% of your materials are free!)

You mix with portland cement almost any type of soil including any old road surfacing. After the mixture hardens add a bituminous surface. You get a pavement good for 20 years plus.

It's the fastest-laid pavement there is. Well-organized crews have built two miles a day with modern road-building equipment. Today's engineers are making soil-cement America's fastest-growing, low-cost pavement. Write for free booklet, "Soil-Cement Pavement." Distributed only in U.S. and Canada.

*Low cost . . . it's the  
20-year-plus pavement for*

**ROADS • STREETS  
SHOULDERS • SUBBASES  
AIRPORTS • PARKING LOTS**

**MODERN  
soil-cement**

### **PORTLAND CEMENT ASSOCIATION**

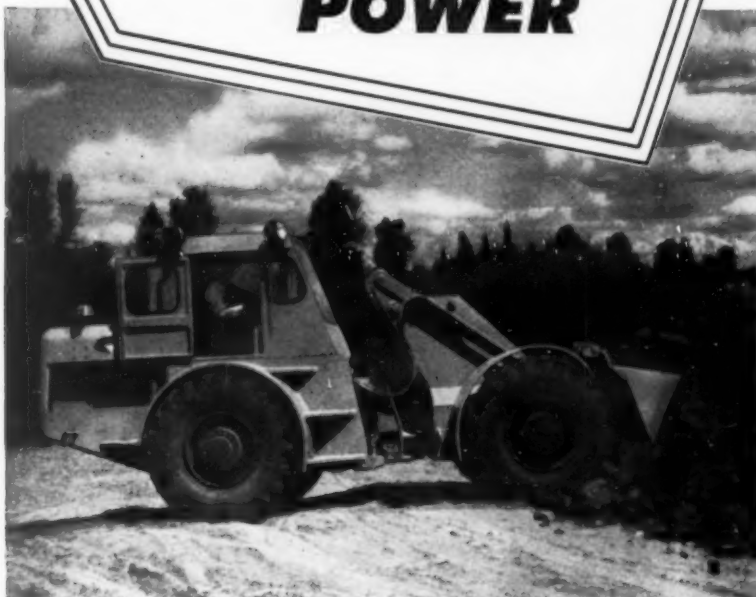
Dept. 5-28, 33 West Grand Avenue, Chicago 10, Illinois

*A national organization to improve and extend the uses of portland cement and concrete*

*. . . for more details circle 314 on enclosed return postal card*

LOADING SHOT ROCK

takes **EXTRA  
POWER**



does it easily  
with

**WAUKESHA**  
*Diesel*

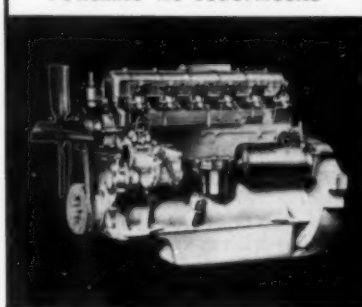
● Tough stuff to load—that shot rock! Takes a real loader with an engine that can pour on the power. With its Waukesha Diesel, and 100% breakout bucket action, this 1½ cu. yd. LD 5P Scoopmobile handles a lot of yardage for Bowman Sand & Gravel Co., Albany, Oregon—steadily, smoothly, quickly. Four-wheel planetary drive gives power to spare. Power steering, power shift forward and reverse transmission, and 4-wheel power brakes lighten the work of the operator. Waukesha Diesels also give you easy starting, quick warm-up, snappy acceleration, with high fuel economy and most economical upkeep.

372

**WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN**  
NEW YORK                      TULSA                      LOS ANGELES

... for more details circle 336 on enclosed return postal card

**POWERING the SCOOPMOBILE**



**Waukesha 190-DLC Diesel**—Six cylinders, 3¾ x 4-inch, 265 cubic inch displacement. Send for descriptive bulletin 1411.



"Work Bull 303" with "500" Loader

direct line thrust with telescopic reach. It is equipped with a 3-spool valve so that additional hydraulics do not have to be added for extra attachments. Quick-change attachments include a pick-up street sweeper, swinging crane, lift fork, angle dozer, scarifier, rotary broom, and several sizes of buckets.

The "Work Bull 303" features instant reversing, combination accelerator-directional control pedals, torque converter, power steering and double-disc brakes. Power diversion of the 52-hp, 208-cu. in. displacement engine is provided by a torque converter.

Massey-Ferguson Industrial Division,  
1009 South West St., Wichita, Kansas.

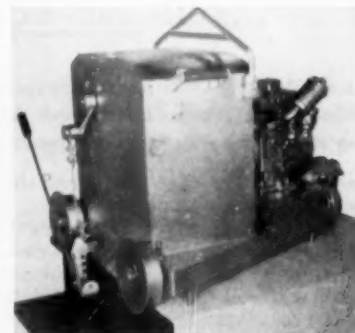
For more details circle 117 on  
Enclosed Return Postal Card.

**Automatic Pin Puller**

A new automatic pin pulling machine, the "Cleveland Pin Puller," is operated by one man and is designed to remove up to 1500 pins per hour without damage to forms or concrete.

Weighing 565 lb. and powered by a 3-hp engine, the machine is designed to pull any size pin with a maximum load strength of 3000 lb.

Cleveland Form Grader Co., Avon, O.



**Cleveland Pin Puller**

For more details circle 118 on  
Enclosed Return Postal Card.

More New Products  
on pages 108 and 133

**ROADS AND STREETS, May, 1958**



# HEAVY POST-TENSIONED CONCRETE GIRDERS FOR SECOND NARROWS BRIDGE

*New crossing at Vancouver, B.C., includes 108 girders each 120 feet long and weighing 74 tons.*



Carl Stanwick

**By Carl Stanwick**

Chief Engineer, Kiewit-Raymond Construction Company,  
Vancouver, British Columbia

WITH the ever-increasing traffic congestions which have developed across the Burrard Inlet after the Second World War, the British Columbia Toll Highways and Bridges Authority found it most imperative to remedy the situation.

Preliminary studies and final design were made for the government by the consulting firm of Swan, Wooster and Partners in 1955. They investigated the possibility of a high level bridge crossing of either a cantilever or suspension type and a causeway with lock. A six-lane deck cantilever bridge was chosen, with a main span of 1,100 ft. and side spans of 466 ft. In the fall of 1956 Peter Kiewit

and Raymond International were the successful joint bidders. Work began in January, 1957.

The north end of the bridge's main approach consists of 3,300 ft. of gravel fill up to 47 ft. in height, with cloverleaf overpasses of reinforced concrete. The 2,210 ft. interval south of the north abutment are made up of nine 120 ft. post-tensioned concrete girder spans and four 282 ft. warren deck trusses, all on a five percent grade. Vertical clearance is 145 ft. at high tide under the main span, with the deck 215 ft. above water level.

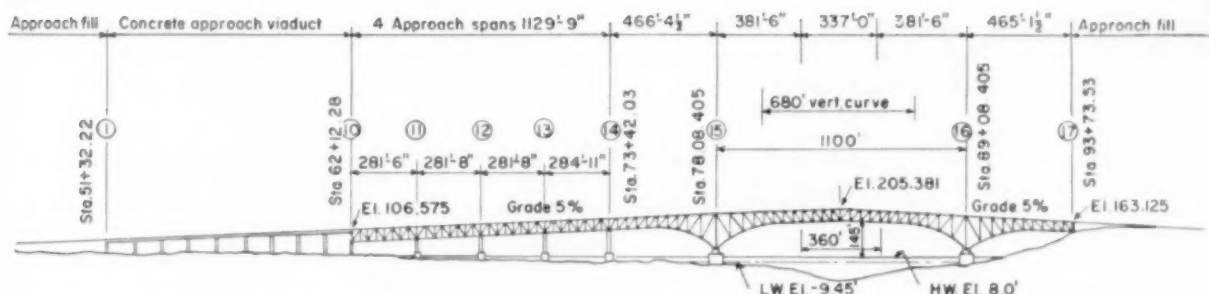
Some of the job quantities are 107,000 ft. of timber and 59,000 ft. of steel bearing piles, 75,000 cu.

- Beams being transported from the casting yard by a pair of specially designed "straddlers".





● Up comes 76 tons, balanced between two cranes. Note outrigger frame on nearest crane's track frame.



● The prestressed girder spans (left) in relation to the overall scheme of spans for the Second Narrows Bridge.

yd. of reinforced concrete, 2,500 tons of reinforcing steel and 16,000 tons of structural steel placed, with 110,000 cu. yd. of excavations and 500,00 cu. yd. of fill.

● The prestressed concrete construction for the viaduct superstructure was found to be competitive in cost against a steel structure. The prestressed concrete girders and deck were designed by A. B. Sanderson and Company, of Victoria, B. C. The nine 120 ft. concrete girder spans are of the post-tension T-section type. Girders are spaced at 6'7" centers over a 6x10 ft. concrete cap-beam.

There are two sets of six girders to each span, tied together

transversely by four lines of diaphragms 6 in. wide and 5'6" deep. The girders are 7 ft. high with a 21 in. wide base and 36 in. top T-section.

There are ten 1 5/8-in. diameter Tecon Kopex tubes in each beam; each tube contains twelve 0.276 in. diameter high tensile wires. The ultimate tensile stress of wires is 220,000 psi. The wire was imported from Belgium and was tested not only at the mill but also on the job. The anchorage used for the wires is the Freyssinet cone. The final prestressing force per cable (12 wires), after all losses are taken into account, is 86,000 lb.

Outside the high tensile wires the girders are reinforced with

No. 3 and No. 4 standard reinforcing steel to counteract temperature stresses and to aid in bonding the 8-in. deck slab to the girder. A perfect bond between girder and slab was considered most imperative for proper stress distribution in the T-section.

● *Stressing Procedure.* The stressing procedure follows:

First Stage — Sufficient cables were stressed to permit the removal of the beam from the casting bed. Four cables (Nos. 1, 2, 5 and 6) were stressed in that order. At this first stage of stressing the concrete was required to have attained a minimum strength of 3,000 psi. (The design strength of the concrete for the prestressed girders is 5,000 psi at 28 days).

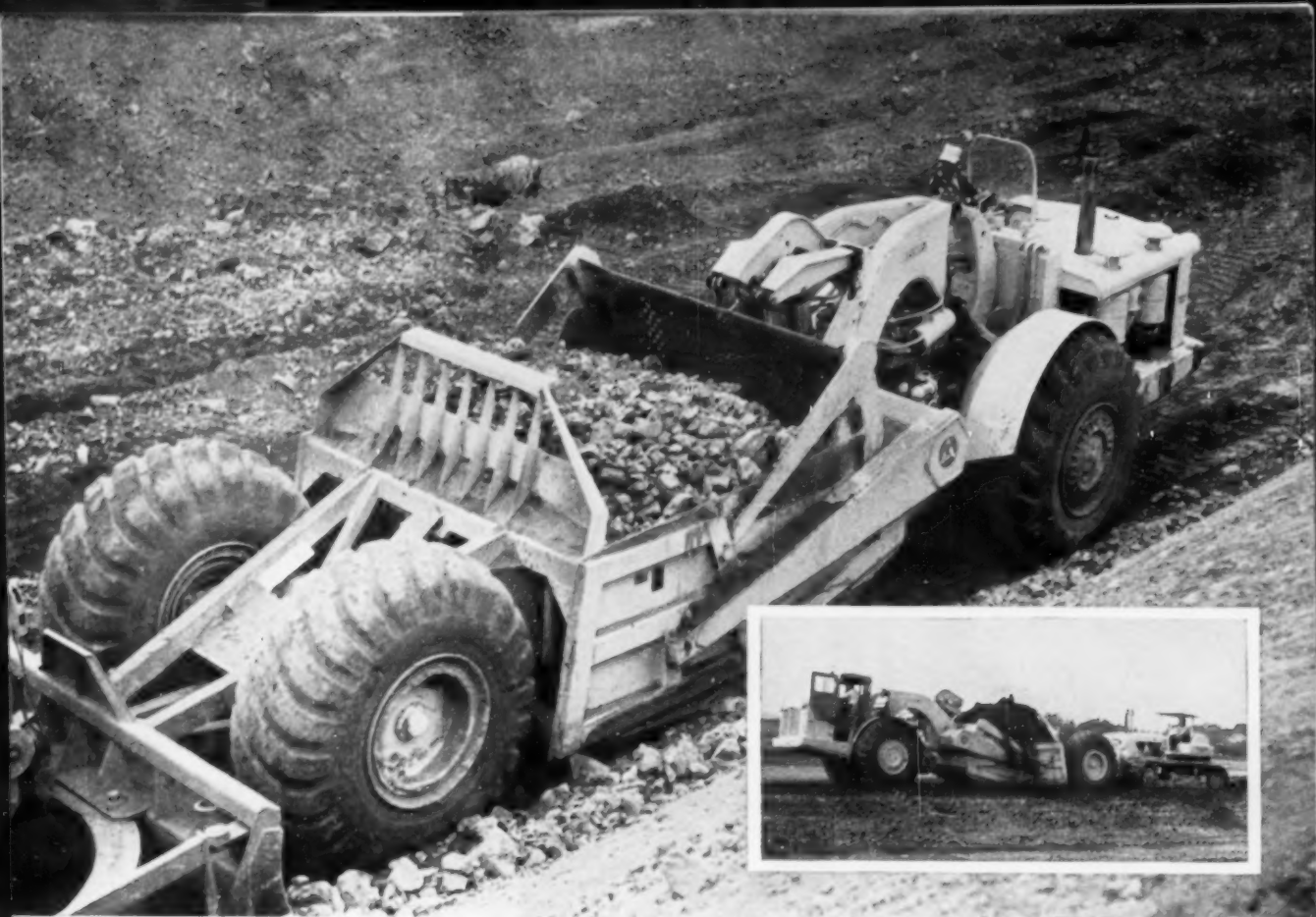
Second Stage—The remaining six cables were stressed only after the concrete had reached its full design strength. Cables 3, 4, 7, 8, 9 and 10 were stressed in that order. The jacking stresses per

cable varied from 115,000 (+) to 113,000 lb. (+). The difference between jacking and final stresses was to compensate for the following friction losses:

1. Friction loss in jack.
2. Friction loss in anchorage.
3. Friction caused by wavy ducts.
4. Friction between duct and tendons.
5. Cone slip on anchorage.

The cables were stressed from both ends of the girder by two hydraulic jacks. The elongation of the wires ranged from 3 15/16 in. at either end to 3 7/8 in.

A hydraulic system equipped with a pressure gauge, fed both jacks simultaneously. The gauge pressure was an additional check



## Gets 21-yard loads in 34 seconds . . . . . . moves 285 bank yards per hour with S-18 "Eucs"

The first Interstate Highway contract in New Jersey was awarded to Public Constructors, Inc. of Gloucester, New Jersey. Started in September 1957, it is scheduled for completion in one year.

For the 800,000 yards of excavation, Public Constructors selected seven Euclid S-18 Scrapers with Torqmatic Drive. Working 58 hours per week, these "Eucs" completed 40% of the earthmoving during the first month of operation.

Each of three S-18's in one spread averaged nearly 13 trips per hour on a 2450' cycle under adverse load, haul and dump conditions. Payloads averaged over 14 bank yards of very hard ripped rock containing chunks up to 4' in diameter.

On another section of the job with more favorable conditions and with a Euclid TC-12 Crawler pushing, the S-18 Scrapers loaded out 21 loose yards of gravel, clay and decomposed shale in 34 seconds. Making the

3200' cycle in 3.84 minutes, hourly production per unit averaged 285 bank yards.

The variety of loading and hauling conditions on this job points up the advantages of Euclid Scrapers with Torqmatic Drive. Maximum usable traction and power to meet continually changing grades and rolling resistance are provided automatically. The operator doesn't have to clutch and down-shift for grades and soft spots on the haul or fill—there's no gear-shift guesswork so cycle time is kept to the minimum. Heavy construction of the bowl and tractor frame enables the "Eucs" to withstand pushloading by the biggest crawlers in the most difficult materials.

Before you decide on any scraper for present or future work, check the money-saving features of these "Eucs". Your dealer has facts and figures that show why so many users have proved that **Euclids are your best investment.**

**EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio**

... for more details circle 272 on enclosed return postal card



# EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



## Work Horse in the Casting Yard

- Man-of-all-work at B.C. Concrete Ltd.'s casting yard where the big beams were made was this Michigan 75B tractor shovel. (Upper Left): The bucket is under the concrete mixer for a batch load. (Upper Right): Batch being deposited in the forms. (Lower Left): Hoist power of the shovel bucket used to raise one end of a beam up to transporting position. The machine also gave towing service when needed.

to insure correct stress in the wires.

With all the ten cables stressed, a total force of approximately 900,000 lb. acted on the ends of each girder and gave it a camber of  $2\frac{1}{4}$  in. ( $= -$ ). In superimposing the concrete deck on the beams, one-third of the camber was lost. The remaining camber will compensate for deflection by the live load.

After all the wires had been stressed, the Copex tubing was flushed with water and grout forced into the tubing at high pressure to fill all the void space and bond the wires. The grout of non-shrink design was composed of:

- Three bags of cement, to
- One bag of Alfsesil.
- One bag of Intrusion Aid.
- 4 cu. ft. of fine sand,
- 16 gal. water (about).

The standard flow cone read-

ings for the above were to be 22 seconds but not less than 20 seconds.

The functions of the Alfsesil and Intrusion Aid were to make the grout more workable, eliminate shrinkage and prevent the separation of the cement, sand and water at high pressures.

The aggregate ratios used for the 5,000 psi concrete were: cement 612 lb., sand 1,200 lb., torpedo 400 lb.,  $\frac{3}{4}$  in. aggregate 1,700 lb., Pozzolith  $1\frac{1}{4}$  lb., water 250 to 300 lb.

Screen analysis was taken of an aggregate sample from every other load of concrete delivered. If the material was found too coarse or fine, adjustments were made. The concrete was all delivered from the Deeks-McBridge and Evans Coleman and Evans ready-mix plants. The concrete which was kept at a water-cement ratio of 0.408 to 0.425 gave a 2

in. (+ -) slump and was fairly workable. Deposition in the metal forms was done by belt conveyor.

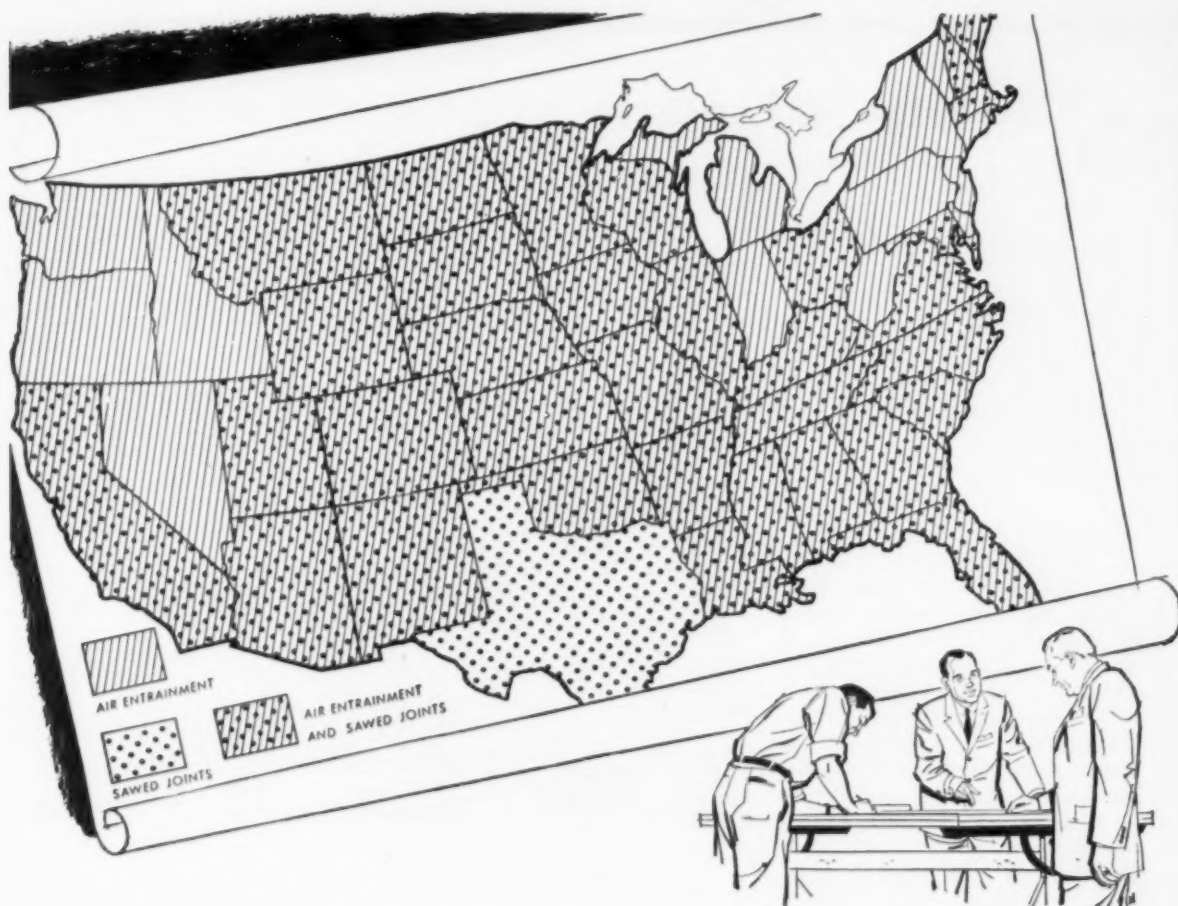
To insure good consolidation of the concrete, four electric form vibrators (Syntron) and two internal vibrators were used during placing.

● *Casting Yard.* The casting yard was made up of eight pile-supported concrete casting beds spaced at 12 ft. centers. Because of the large number of girders to be made (108), it was found most satisfactory to use metal forms. The casting procedure was as follows:

1. The sole plates for the beams were set and aligned to an accuracy of  $1/64$  in.

2. End forms and steel mats for the end reinforcing were placed. The steel mat reinforcing was  
(Continued on page 103)





## 48 state highway departments list new-type concrete in their specifications

Nationwide, state highway departments now have specifications to cover one or more advances that make today's concrete new-type. More and more states *require* design features like air entrainment and sawed joints for *all* new concrete construction—pavement and structures.

Through your work, you are keenly aware of these advances. You may have been active in their development.

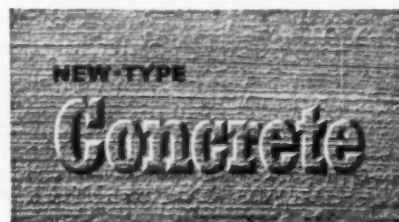
But what about the *public*? The average driver doesn't

yet realize or appreciate what these advances mean to him in terms of increased comfort and safety. And that's where PCA's new national advertising takes a hand . . . to help you tell this story of today's new, smoother-riding concrete to the people who drive your highways.

The support of an informed public can help speed the big highway job . . . especially in the planning and building of the Interstate System.

### PORTLAND CEMENT ASSOCIATION

*A national organization to improve and extend the uses of concrete*



... for more details circle 315 on enclosed return postal card

# "Plenty of real work-power," says Contractor Goodloe

Picks grader's power-plant  
as key to machine's  
big work-output

"The Adams\* has a real fine power-plant and does an excellent job for us," says Phillip C. Goodloe, partner in P. C. Goodloe & Son Co., Fredericksburg, Virginia. "We do a lot of different kinds of work...asphalting, grading, state jobs...we tackle anything a man wants. And our '660' does good work on all of 'em. There's no question about it, the Adams has plenty of real work-power. We didn't know how good it really is, 'til we put it to work. Anyone who sees it cut and move heavy dirt will say the same."

As Mr. Goodloe suggests, "Seeing is believing." Why not ask us to show you the extra work-power you get from a big, powerful Adams 660 grader?



P. C. Goodloe & Son Co.'s 150 hp Adams 660 grader at work for City of Fredericksburg, Va. Big grader cuts side banks,

blades off-street area preparatory to widening 300' section of U.S. 17 (and State #2) near southern edge of the city.



## 5 Reasons Why you get more work-power from Adams 660 power-plant†

**1. 8 forward speeds, 4 reverse, plus 3 optional creeper gears...** match power and speed to load and conditions. You can use full power at "just-right" speed for almost every operation.

**2. 100% anti-friction drive...** ball- and roller-bearings throughout engine-to-wheel drive...delivers bigger percentage of developed horsepower to wheels. Less maintenance is required, bearings give longer trouble-free service.

**3. Constant-mesh transmission...** for fast, no-clash shifting. Crown-shaved helical gears; heat-treated shafts, gears, and cores... for long, quiet life without work-stopping repairs.

**4. Full-floating drive axles** carry no grader weight. Special housings bear weight... permit full tandem oscillation... protect drive axles against power-robbing stresses, and breakage due to rough terrain.

**5. Choice of engine...** GM or Cummins. You choose. Helps you standardize your fleet and reduce parts inventory. You get faster, easier servicing, lower maintenance cost.

†Standard Adams 660 is equipped with 150 hp engine, constant-mesh transmission, speeds to 26.0 mph. POWER-Flow\* 660 has 190 hp engine with torque converter, giving full rpm operation at all speeds, 0.0 to 27.4 mph.

\*Trademark G-1704-DCJ-1



**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

... for more details circle 298 on enclosed return postal card



LIMA Type 44 Pullshovel, owned by S. A. Reubel & Co., trenching near Cincinnati, Ohio.

## **"An extremely rugged machine... plenty of reach for deep trenching" — says S. A. Reubel & Co.**

Back in September, 1956, S. A. Reubel & Co., of Cincinnati, Ohio, bought a LIMA Type 44 Pullshovel to do the heavy digging on its pipelaying jobs. The company tells us: "We have found the LIMA 44 an extremely rugged machine, with the power and weight to do a fine, fast job. It has plenty of reach for deep trenching and is very easy to handle. We are glad to have it working on our team."

Contractors like S. A. Reubel & Co. appreciate the speed, reliability and extra capacity of LIMAS. Here are some of the reasons these machines offer more: All gears, smaller parts and shafts that are subjected to extra wear are flame or induction hardened for

longer life; long, wide crawlers for maximum stability; anti-friction bearings are used at all critical bearing points; large diameter big-capacity drums and sheaves prolong cable life; propel, swing gears, and power take-off enclosed in a sealed oil bath; torque converter (optional).

Find out more about the complete line of LIMA shovels, cranes, draglines and pullshovels with wagon, truck or crawler-mountings. They are designed and built to give you the power and stamina that pay off on every job. See your nearby LIMA distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

... for more details circle 244 on enclosed return postal card

**LIMA** Construction Equipment Division, Lima, Ohio  
**BALDWIN · LIMA · HAMILTON**

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



# NEW, EASY ROCK SALT TREATMENT FOR GRAVEL ROADS

Low-cost Sterling Rock Salt plan saves aggregate, reduces dust, gives year-round durable surface!

**1 DRAINAGE.** Provide adequate, clean ditches. This is essential with a salt-treated road.

**2 AGGREGATE DEPTH.** Make sure it's at least six inches. If this amount is not present on the road, more should be brought in.

**3 SCARIFICATION.** Three-inch minimum required. Even though new materials might have been brought in, scarification is necessary.

**4 FIST TEST FOR COMPACTABILITY.** Dampen handful of road material and squeeze. Mass should retain shape when you release fingers. If not, binder materials should be added to soil.

**5 SPREAD STERLING ROCK SALT** evenly on surface. Use 18 to 30 tons per mile of 20-foot road. (Use 18 tons for 3 inches of loose material. Use 30 tons for 6 inches of loose material.)

**6 BLENDING, SHAPING.** Blending of Sterling Rock Salt must be thorough to get full compaction. Shape road to an "A" crown.

**7 COMPACTION.** Water must be in mix before rolling. If there's no rain or ground moisture, add water. Roll with rubber tires, or let traffic do the job.

Initial costs of this program are low. And, equally important, roads treated with Sterling Rock Salt cost less to maintain! The program can be accomplished with locally available equipment . . . which further reduces costs of rock salt stabilization.

## INTERNATIONAL SALT CO., INC., SCRANTON, PA.

### SALES OFFICES:

Atlanta, Ga.	Chicago, Ill.	Memphis, Tenn.	Philadelphia, Pa.
Baltimore, Md.	Cincinnati, O.	Newark, N. J.	Pittsburgh, Pa.
Boston, Mass.	Cleveland, O.	New Orleans, La.	Richmond, Va.
Buffalo, N. Y.	Detroit, Mich.	New York, N. Y.	St. Louis, Mo.

### FREE . . . SALT-STABILIZATION CASE HISTORIES.

Folder contains editorial reprints describing techniques and results. Can be helpful in planning stabilization for your roads.



To: International Salt Company, Inc., Scranton 2, Penna.  
Department R-2

Name \_\_\_\_\_

Title \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

- ☐ Send free folder.
- ☐ Would like further technical information from International Sales Engineer.
- ☐ Would like quotation on price of Sterling Rock Salt delivered to my area.

Service and research are the extras in

## STERLING SALT

PRODUCT OF INTERNATIONAL SALT COMPANY, INC.

. . . for more details circle 282 on enclosed return postal card



## HEAVY CONCRETE GIRDERS

(Continued from page 98)

used to prevent the cracking of the beam ends by the wedging action of the cable anchorage.

3. The cables were set to proper slope by the aid of pipe templates spaced at regular intervals.

4. All temperature steel was placed for girder and diaphragm stubs.

5. Metal forms were placed and bolted together and to casting bed.

To insure proper vibration of the metal forms by the Syntron vibrators, a rubber strip was placed between the concrete casting bed and the metal form.

It was usual practice to pour the concrete for the girders in the afternoon. Each girder required 34 cu. yd. of concrete, which took about three hours to place. Immediately after the completion of the pouring, the girder was covered by a canvas tent, made up of 20 ft. long pipe frames on rollers, covered with canvas. Steam, supplied from two low pressure steam boilers was fed into 1½ in. diameter perforated pipes running along the full length on either side of the casting bed. With sufficient moisture and temperature ranging around 70 deg. F., the setting of the concrete was speeded up.

By the following morning the concrete was set sufficiently for form removal. A truck crane lifted the forms over to the next bed, in which cables with high tensile wires and temperature steel had already been placed.

After form removal, the canvas cover was replaced over the girder and the steam kept on for another two days. With three days of steam-curing the concrete usually reached the minimum 3,000 psi strength to permit the first four cables to be stressed and for the beam to be removed.

To accommodate lifting of completed girders, a 4-in.-diameter sleeve was cast in each end. The two carriages, made for the job by Willock to transport the beams, were equipped with hydraulic steering gear and 40-ton hydraulic jacks.

After the final stressing of all the wires, the grouting of the



● The completed precast job—all 108 girders in place. Work has begun on forms for the cantilevered sidewalks.

cables was completed and the recess at the anchorage grouted with an Embeco grout.

The girders were lifted into

place by two cranes; the highest lift required 125 ft. boom length. To assure maximum stability

(Continued on page 106)



● (Above): Girder cage nearing completion. (Below): Getting ready for casting. Metal forms being bolted. Girder glimpsed at left has been stripped and is ready for steaming.

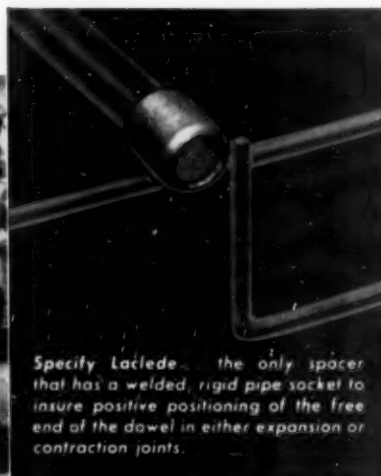


# LACLEDE

pre-assembled

# DOWEL

# UNITS



Specify Laclede... the only spacer that has a welded, rigid pipe socket to insure positive positioning of the free end of the dowel in either expansion or contraction joints.

## *speed paving jobs*

Expansion sleeves, chairs and spacer bars are all precision shop welded... by Laclede... into a complete dowel assembly for expansion, contraction and construction joints.

Delivered to the job site in a single, easy-to-handle unit that maintains rigid alignment, Laclede's new dowel assemblies speed paving jobs by cutting installation labor costs. Additional time and money can be saved by specifying Laclede dowel assemblies with dowels shop coated—ready for immediate installation.

## LACLEDE HIGHWAY STEELS

- prefabricated dowel units
- multi-rib round reinforcing bars
- center joints
- tie bars
- 7-wire strand for prestressing
- welded wire fabric
- recess joints
- accessories



## LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI

Producers of Steel for Industry and Construction

... for more details circle 292 on enclosed return postal card



***"These S-12's are just right for my jobs  
on secondary and two-lane work."***

**SAYS CONTRACTOR FREEMAN HUNTLEY OF ROCK SPRINGS, WYOMING**

• **On a farm-to-market road job . . .**

With hauls of 2200' maximum and 950' average, Huntley's three S-12 "Eucls" put 64,000 bank yards in place in only 10 working days on a two shift basis—a total of 17 hours per day. Each Euclid averaged 125 yds. per hour during this period.

Pat Burns, the General Superintendent for Huntley Construction Company, reports "On this job with all of the wet irrigation ditches and borrow pits to pull through, I have never seen a machine that will pull through and compare under these conditions with the S-12".

It takes outstanding performance to prompt such praise for a piece of equipment, but contractors on all kinds of jobs have found that they can get more work done at lower cost with the Model S-12 Euclid Scraper. It gets around like a 7-yard rig and with 218 h.p. and 17 yd. heaped capacity it piles up the yardage.

Why not get an S-12 production-cost estimate from your Euclid dealer and compare it with the figures on your present scrapers? It won't cost you a penny and may show a way to improve your profit picture—one of the reasons why ***Euclids are your best investment.***

**EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio**

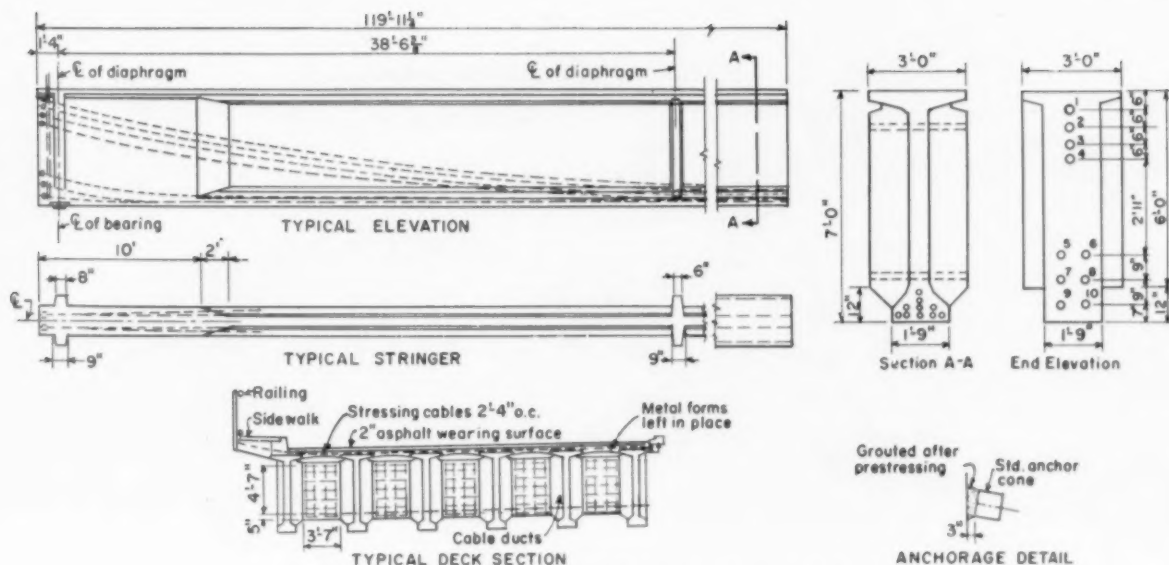


. . . for more details circle 275 on enclosed return postal card



**EUCLID EQUIPMENT**

FOR MOVING EARTH, ROCK, COAL AND ORE



• Structural details on the 120 ft. long prestressed girders.

## HEAVY CONCRETE GIRDERS

(Continued from page 103)  
during the hoisting of the 76-ton concrete girders, the cranes were equipped with 35-ton counterweights and heavy outriggers

with wheels. These were constructed in the Arrow Steel Yards. The entire hoisting operation was carried out by Arrow Transfer.

The ends of the girders are

supported on the cap beams on a bearing assembly made up of two Lubrite blocks between the sole and bed plates. The top of the blocks is machined off to a 9 in. radius to provide for radial mo-

Do the **BIG SWEEPING JOBS**  
the easy, low-cost way!



**CARSON**  **SWEEPER**

### Many Year Around Uses!

- Streets and Alleys • Airport Runways
- Road Construction • Parking Lots and Driveways
- Asphalt Paving Preparation • Factory Areeays

**ADAPTABLE** to any pulling unit  
with **POWER TAKEOFF SHAFT!**

Write for full details today!

**CARSON MANUFACTURING CO.**  
P. O. BOX 256 Dept. RS Maryville, Missouri

... for more details circle 250 on enclosed return postal card

106

## Masonry or Concrete Saw Blade Selection Problem?



**MASONRY CUTTING . . .**  
tile, block, refractory, brick  
. . . or other masonry building

materials or . . .

**CONCRETE SAWING . . .** highway joints,  
street openings, curb cutting or other main-  
tenance jobs.

For help in selecting the best blade for any  
job, just phone Bill . . . and phone collect.

Without obligation, Bill will use his 12 years  
of blade selection experience to help you select  
the blade that will provide you top  
results . . . hence top profits.



**CHAMPION MFG. CO.**  
2028 WASHINGTON AVE., ST. LOUIS, MO.

... for more details circle 264 on enclosed return postal card

**ROADS AND STREETS, May, 1958**



tion of the girder ends. The bed-plate on the lower end of each girder is provided for expansion and contraction. After set to proper elevation, all the bed-plats were dry-packed to insure a good bearing.

After the beams had been set and properly aligned, the diaphragms were cast and the span made ready to receive the concrete deck.

For ease and economy 16 and 18 gauge galvanized, corrugated metal, which was permanently left in place, was used for deck forms between the beams. After the deck-forms, the temperature steel for the deck plate and the cables for the transverse stressing were placed. The transverse cables in the deck, which were spaced at 2' 8" centers, each contained ten 0.276 in. diameter high tensile wires.

● For the deck concrete  $\frac{3}{4}$  in. aggregate was used with a low-heat Pozzolite. The admix was to retard the setting of the concrete until all vertical movements on the 120-ft. span had ceased and consequently obviated cracking of the partially set concrete.

The sidewalks are made up of  $3\frac{1}{2}$  in. thick precast sections. These are cantilevered from the outmost beams on either side of the main deck and supported on cast-in-place brackets spaced at 8 ft. intervals.

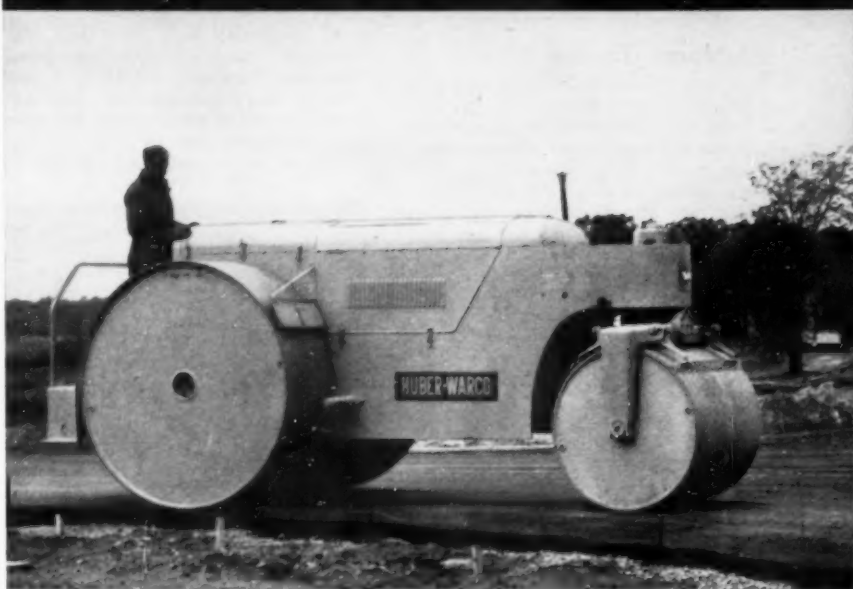
After the concrete in the diaphragms and deck had reached the 3,000 psi design strength, the transverse stressing was carried out in a similar manner to that of the girders.

The roadway deck design includes a 2-in. asphaltic wearing surface divided by a 3-ft. median strip. The roadway has a maximum capacity of 10,000 cars per hour and will serve an estimated six to seven million cars annually in the first few years of its existence.

● Kentucky highway commissioner James W. Martin has extended the ban against new utility facilities along rights-of-way of Interstate highways and expressways in Kentucky. In an official order, commissioner Martin made the ban apply to all controlled-excess roads.

## HUBER-WARCO

### 3-Wheel rollers



### built for a rugged long life

Let's talk features—features that make the Huber-Warco 3-WHEEL ROLLER a durable, efficient machine. Rugged construction . . . torque converter . . . tail-shaft governor . . . 2-speed transmission . . . three-point "live" suspension to cushion shocks . . . anti-friction bearings throughout . . . completely adjustable guide roll assembly . . . dual braking systems are important features that mean efficiency and economy of operation. Huber-Warco 3-WHEEL ROLLERS are gasoline or diesel powered, and are available in standard and variable weight models. Your Huber-Warco distributor can give you the complete details . . . contact him today.



TANDEM ROLLERS



3-WHEEL ROLLERS



MAINTAINER



MOTOR GRADERS

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Send specifications on Huber-Warco 3-wheel rollers.

Send specifications on: ☐ Maintainer ☐ Motor Graders ☐ Tandem Rollers

Name

Title

Company

Address

City  Zone  State

5-RS



## New Products

(Continued from page 94)

### Platform Trailer

A new Fruehauf "Workhorse" platform trailer incorporates 19½ in. deep I-beam fabricated steel main members, interwelded with I-beam crossmembers. Over 50,000 lb. payload capacity has been added to this new sturdy platform that incorporates a saving of 1,200 lb. in weight. Main members extend to surface of platform boards to carry and reinforce heavy-duty truck loading operations.



"Workhorse" Platform Trailer

Trailer is available in single and tandem axle and 4-wheel models.

Fruehauf Trailer Co., Public Relations Dept., Detroit 32, Mich.

For more details circle 119 on  
Enclosed Return Postal Card.

### New Dustless Stoper

A completely new rock drill, the "Vacujet" dustless stoper, developed by Ingersoll-Rand, sucks all dust and cuttings down through the drill and then discharges them under pressure through a long hose to a tank or bag 25 feet or more away from the drill.



Vacujet Dustless Stoper

The drill steels have a tapered bit end and shank eliminating the need for forging and heat treating. Reconditioning is done simply by turning the bit end and grinding or drilling the shank end. Large passages through the specially designed drill steel are stated to allow extra fast full throttle drilling.

Ingersoll-Rand, 11 Broadway, New York 4, N.Y.

For more details circle 120 on  
Enclosed Return Postal Card.

### Crawler Tractors

A completely new line of OC-4 crawler tractors, announced by The Oliver Corporation, features added power, availability in both gasoline and diesel models, and important transmission improvements. The new OC-4 engine develops 29 hp in either the gas or diesel models. Both models have 85 percent interchangeability of parts. The gas and diesel engine are interchangeable with each other.

One of the transmission improvements is the "Traver-Reverser," with which the operator can reverse the tractor, maintaining the same speed in reverse as in forward, by merely de-clutching and pulling back a lever. This is true for all four forward speeds.

Also available is a new speed reduction development known as the "Slo-Lo," by which the operator can reduce

# Ferguson

Gasoline or diesel  
power, torque  
converter, 2-speed  
transmission,  
hydraulic steering,  
dual controls,  
60" rolling width.

## 8-12 TON TANDEM ROLLER

with  
**TORQUE  
CONVERTER**



Self-propelled  
rubber-tired  
rollers in 10, 12  
and 25 ton sizes.

WRITE FOR BROCHURE

ROLLERS FOR EVERY PURPOSE

**SHOVEL SUPPLY COMPANY**

4900 HINES BLVD. • P. O. BOX 1369 • DALLAS, TEXAS

... for more details circle 327 on enclosed return postal card



**New OC-4 Crawler Tractor**

any of the four forward and backward speeds by approximately 50 per cent simply by de-clutching and pulling a lever.

**Industrial Division, The Oliver Corporation, 400 W. Madison St., Chicago 6, Ill.**

For more details circle 121 on Enclosed Return Postal Card.

## 12 Ton Trailer

A new 12-ton capacity, Model C-55—a "between-the-wheels" tilt-top unit announced by Hyster Co.—is designed for hauling the caterpillar No. 955 Traxcavator and other track-type equipment. A loading angle of only 12 degrees also permits easy loading of low-tractive equipment, such as road rollers. The fully-decked platform of the new trailer is 16 ft. long and 6 1/4 in. wide. Overall dimensions are 20 ft. 4 in. long and 8 ft. wide. Platform height is 27 in. with a road clearance of 9 in.

**Hyster Company, Martin Trailer Division, Kewanee, Ill.**



**Hyster C-55 Trailer**

For more details circle 122 on Enclosed Return Postal Card.

## Ballasted Luminaire Cuts Costs

Use of a new 400-watt mercury luminaire with a built-in ballast effects average savings of about \$45 per pole in street lighting installations according to an announcement from General Electric's Outdoor Lighting Department. The luminaire-ballast unit eliminates the need for costly transformer-base poles or pole-top adapters and complicated, time-consuming wiring; and though the luminaire by itself is more expensive, there is an over-all saving as noted.

Called the "Power Pack", this new unit is said to be the first 400-watt mer-

# HUBER-WARCO

## motor graders

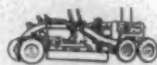


## 5D-190 . . . world's most powerful

The Huber-Warco 5D-190 MOTOR GRADER has been designed to make faster passes and smoother cuts for more profitable grader operation. Features include: 195 h.p. diesel engine . . . torque converter . . . tail-shaft governor . . . power-shift transmission . . . and NO CLUTCH. The operator sets the desired speed and the tail-shaft governor maintains that speed regardless of load conditions. The Huber-Warco 5D-190 is "power-packed" to handle a tough grading assignment quickly and efficiently. See your Huber-Warco distributor for complete details.



MAINTAINER



MOTOR GRADERS



TANDEM ROLLERS



3-WHEEL ROLLERS

**Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.**

**HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.**

**Send me specifications on the Huber-Warco**

☐ 5D-190 ☐ other motor graders

Send specifications on: ☐ Maintainer

☐ Tandem Rollers ☐ 3-Wheel Rollers

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_

5-RS





The "Power-Pack" Luminaire. Ballast is inside the elongated slipfitter.

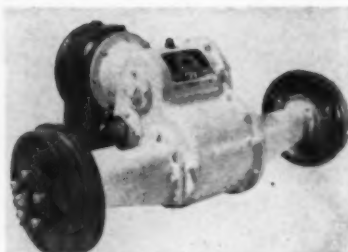
cury luminaire equipped with an internal ballast.

Outdoor Lighting Department, General Electric Co., Hendersonville, N. C.

For more details circle 123 on Enclosed Return Postal Card.

### Axle-Transmission Unit

A small, 2-speed, forward and reverse transmission axle combination unit equipped with hydraulic forward and reverse clutches running in oil is now in production by Transmission & Gear Co. The new unit, designated the "RT-629-C Axle & Transmission," eliminates the necessity of an engine clutch in fork lifts, loaders and similar material handling equipment. For added versatility and convenience, it is available with or without a Westinghouse torque converter. Gear ratios are 10 to 1 in high speeds and 24 to 1 in low speeds. Capacity is 30 hp input at 2000 rpm. The unit is available



RT-629-C Axle & Transmission

with thread widths of 35 in., 40 in., 48 in. and 62 inch.

Transmission & Gear Co., Dearborn, Michigan.

For more details circle 124 on Enclosed Return Postal Card.

### Steel Stake Puller

A new simplified stake puller, designed for pulling Symons construction stakes, easily removes steel stakes from hard or frozen ground. It can remove stakes as long as 36 in. and has a mechanical advantage of 7:1. It weighs 10 lb.

Symons Clamp & Mfg. Co., 4249 West Diversey Ave., Chicago 39, Ill.



Steel Stake Puller

For more details circle 125 on Enclosed Return Postal Card.

### Dragline Bucket

A new dragline bucket, announced by Young Iron Works, has teeth angled for maximum penetration, with outside teeth at extreme corner of bucket to increase digging power by loosening the ground ahead of the bucket cutting edge.

The buckets are ruggedly constructed, with cutting edge of high strength

forged steel, corners and runners of special abrasion-resistant steel, hardened alloy steel pins throughout, and hardened bushings at all pin connections. Sealed Timken roller bearings are used in the dump block. The complete line includes buckets from  $\frac{3}{8}$  cu. yd. to 10 cu. yd., with or without perforations.

Young Iron Works, 2959 - 1st Ave. Seattle 4, Wash.



Young Dragline Bucket

For more details circle 126 on Enclosed Return Postal Card.

### Truck Materials Cabinet

A new U-56 all purpose cross compartment, announced by Utility Body Co., provides a variety of storage space, from small part bins to large bulk material storage areas. It can be installed across the front of any pickup bed or on any flat bed truck. Side door is provided with keyed lock, and top lid has provision for padlock.

Utility Body Co., 1530 Wood St., Oakland 7, Calif.



U-56 Cross Compartment

For more details circle 127 on Enclosed Return Postal Card.

### Blacktop Patch Boiler

An inexpensive, hydraulically operated blacktop patch roller for fast and easy attachment to any dump truck has been announced by the Martin Co. The simple, self-cleaning, self-contained unit is claimed to make patches that stick by using controlled compaction maintained by hydraulic pressure against the weight of the truck. Lower the unit to roll the patch—draw it



... FOR ONLY 35¢

"Codit" Reflective Liquid goes on fast by brush or spray. Hazards flash their own bright warning at night for safety. Reflectivity lasts up to 2 years. Buy your supply from your 3M Representative or write 3M Company, Dept. NR-58, St. Paul 6, Minnesota.



Get Codit Reflective Liquid in 6 oz. aerosol spray, 5 lb. can, or in complete safety kit.



... for more details circle 305 on enclosed return postal card





**Martin Patcher**

up under the box to travel. The patcher adds little weight to the vehicle and does not limit road clearance.

Martin Company, 620 Andrews Ave., Kewanee, Ill.

For more details circle 128 on Enclosed Return Postal Card.

### Aluminum Dump Trailer

A semi-frameless dump trailer with all-aluminum body, stated to weigh 3,000 lb. less than a conventional steel trailer, has been placed on the market by the Lodestar Corp. The unit, illustrated here, is 22 ft. long, has a 26-cu. yd. capacity, and weighs 8,900 lb.—including the 150 lb. of oil in the hydraulically operated, 5-sleeve telescopic lifting cylinder.

The floor of the body is a formed, one-piece unit with a one and one-half inch flange to which the side panel—which is also a formed, one-piece unit 48 inches high—can be welded. Rigidity is obtained through widely spaced, longitudinal and cross-members, supporting tapered pyramids flared to cover a large area on the rub rail, and boxed and capped upper flange of side panel.

Lodestar Corp., Niles, O.



**Lodestar Dump Trailer, Full Height**

For more details circle 129 on Enclosed Return Postal Card.

(Continued on page 133)

## HUBER-WARCO

### tandem rollers



### Strawser Paving more than satisfied

"We're sold on Huber-Warco equipment." That was the comment of Nyle Strawser, vice president of Strawser Paving Company of Columbus, Ohio. "On this job," stated Mr. Strawser, "we double-teamed our Huber-Warco 3-5 and 5-8 ton Tandems, and used one of our three Huber-Warco Maintainers for finish grading on the shoulders." Mr. Strawser continued, "Our Huber-Warco equipment has performed well for us, with only a minimum of maintenance." Why not get all the details . . . contact your nearest Huber-Warco distributor today.



MOTOR GRADERS



TANDEM ROLLERS



3-WHEEL ROLLERS



MAINTAINER

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Send specifications on Huber-Warco tandem rollers.

Send specifications on: ☐ Maintainer  
☐ Motor Graders ☐ 3-Wheel Rollers

Name \_\_\_\_\_

Title \_\_\_\_\_

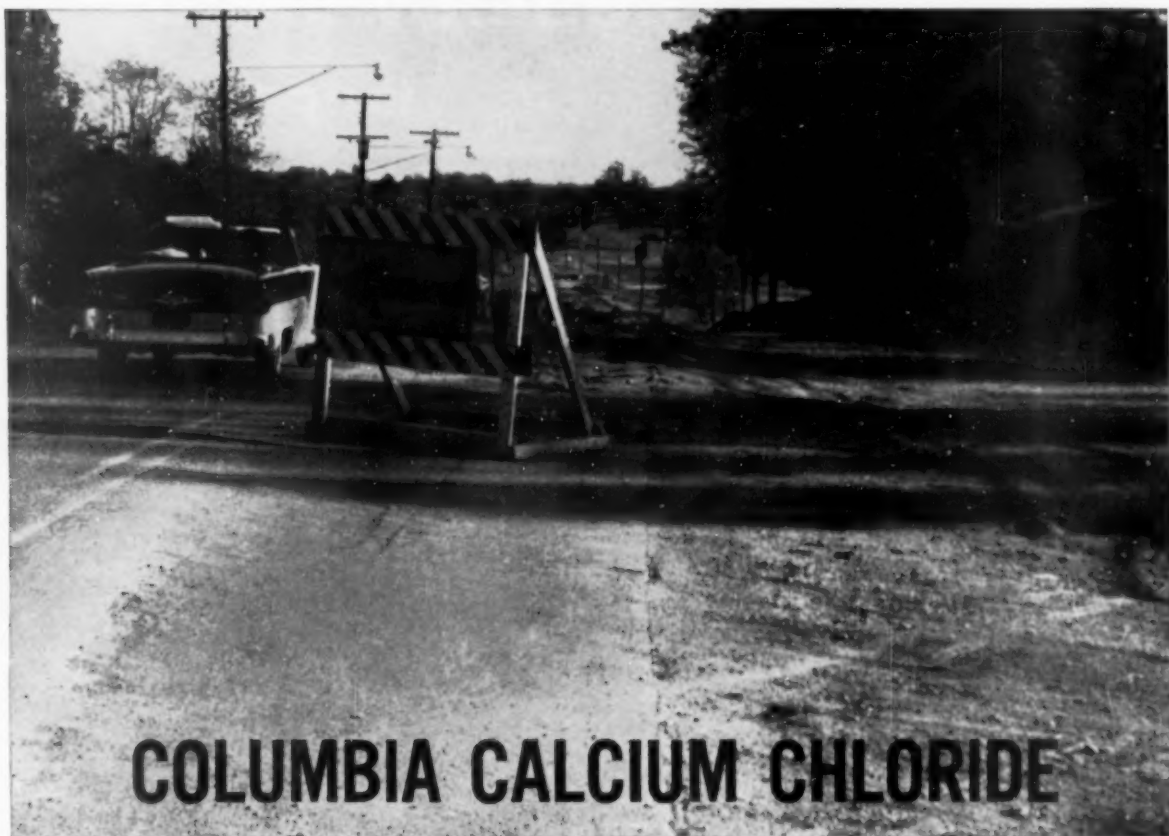
Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

5-25





## COLUMBIA CALCIUM CHLORIDE

### KEEPS DUST DOWN AND ROADS UP

Dust caused by traffic and by your construction and maintenance work creates public relations problems. Municipalities, nearby residents, and drivers don't like it. Your own crews don't like it. Efficiency goes down, and the chances of costly accidents increase.

Road and construction dust can be controlled very inexpensively with Columbia Calcium Chloride. This "thirsty" chemical absorbs moisture from the air to keep soil slightly damp. In addition to "sweetening" applications on road surfaces, you'll find it pays to spread Columbia Calcium Chloride through and immediately around working areas, in parking spots, and over detours and by-passes.

Heavier seasonal traffic means your attention will be on improving shoulders, too. Again, Columbia Calcium Chloride application produces solidly stabilized shoulders, safe for bearing of traffic and off-road parking.

When major reconstruction of roads or new road building is on your schedule, don't overlook applying Columbia Calcium Chloride to dense-graded aggregate bases. Effective stabilization is vital here.

You'll be using this versatile chemical product throughout the summer. Why not contact your nearest Columbia-Southern District Office now and arrange for quick delivery. For both product and service, specify Columbia-Southern.



Available in two forms—  
High Test Flake (94-97%  $\text{CaCl}_2$ )  
and Regular Flake (77-80%  $\text{CaCl}_2$ )

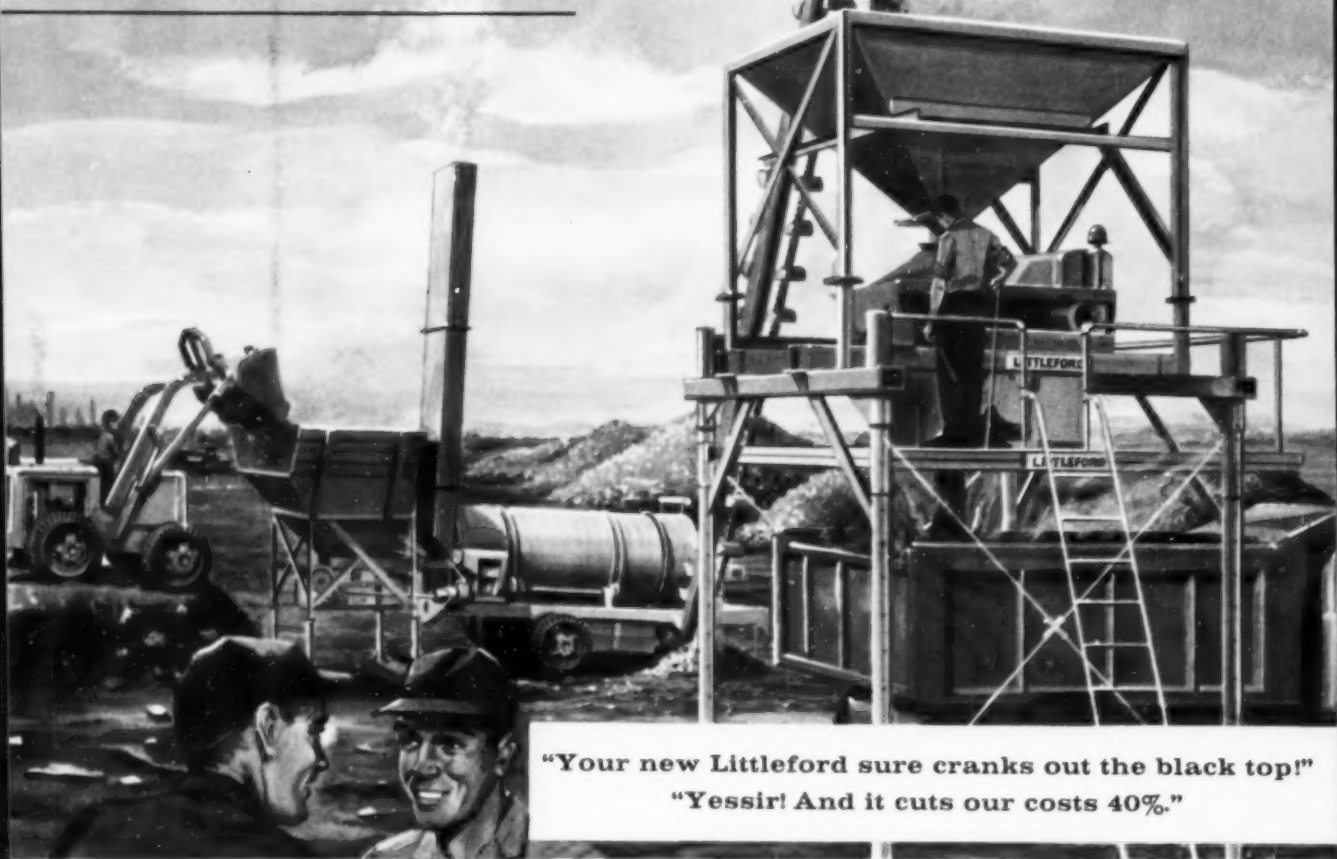
## COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company

One Gateway Center, Pittsburgh 22, Pennsylvania DISTRICT OFFICES: Cincinnati, Charlotte, Chicago, Cleveland, Boston, New York, St. Louis, Minneapolis, New Orleans, Dallas, Houston, Pittsburgh, Philadelphia, San Francisco IN CANADA: Standard Chemical Limited

... for more details circle 263 on enclosed return postal card

# NEW LITTLEFORD PORTABLE ASPHALT PLANT



**"Your new Littleford sure cranks out the black top!"  
"Yessir! And it cuts our costs 40%."**



## TOP EFFICIENCY IN ASPHALT PLANT

### DESIGN AND OPERATION

- 1 Dual feeder bin proportions and feeds aggregate directly into dryer.
- 2 Rotating steel dryer quickly and efficiently dries aggregate.
- 3 Hot elevator delivers a continuous cascade of aggregate into storage hopper.
- 4 Storage hopper holds and discharges aggregate as required.
- 5 Batching hopper measures aggregate in exact 10 cu. ft. batches in reserve for the pugmill.
- 6 Pugmill thoroughly mixes hot dried aggregate and bitumen into a hot bituminous concrete.
- 7 Self-elevating platform permits discharging of bituminous concrete directly into trucks.

**Contractors: Make Money with your own asphalt plant.** Get the facts—mail this airmail card today for your free copy of bulletin 37 giving complete information.

The 30-ton rated capacity of the new Littleford Portable Asphalt Plant now gives contractors big plant performance at small plant cost. Saves up to 40% on bituminous concrete costs . . . because the contractor can use his equipment more efficiently. Labor costs are drastically reduced, too, because you can take the Littleford Portable Asphalt Plant right to the job site.

With his own independent source of bituminous concrete,

the contractor has complete control. He can plan and carry out black top operations when and where he wishes, around the clock and around the calendar.

The new Littleford Portable Asphalt Plant is quality built . . . for continuous output, for producing all types of mixes at lowest cost. Investigate this new plant today . . . discover the money-making possibilities you can realize!

**LITTLEFORD BROS., INC., 457 EAST PEARL STREET, CINCINNATI 2, OHIO**

- ☐ ASPHALT PLANT—Rush me, without obligation, bulletin 37 that illustrates and describes the new Littleford Model 121-30 Portable Asphalt Plant.
- ☐ PAVER-SPREADER—Bulletin 33 on the True-Lay Paver Spreader shown on the next page.
- ☐ SPRAY MASTER—Bulletin 14 on the Spray Master Bituminous Distributor also shown on the next page.

COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
INDIVIDUAL \_\_\_\_\_ TITLE \_\_\_\_\_



## LITTLEFORD SPRAY MASTER

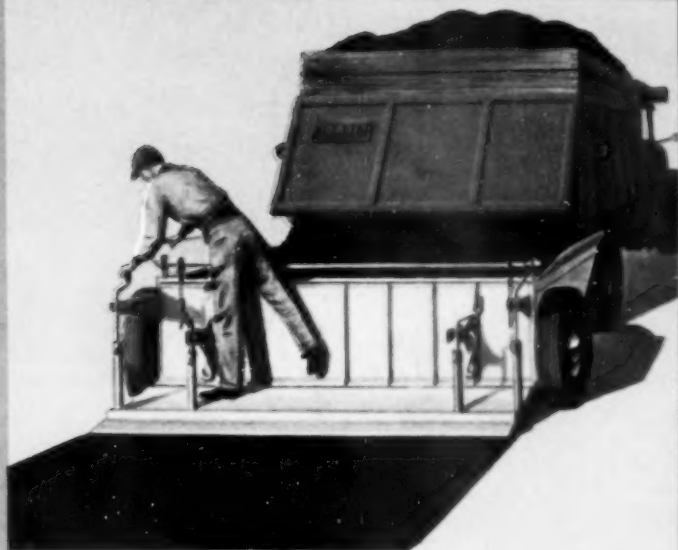
### BITUMINOUS DISTRIBUTOR

Design ingenuity has built into the Littleford Spray Master an *unequalled* combination of engineered features that assure faster, better and cheaper spraying. Two of these are illustrated here:

**Single Lever Control**—Not four confusing levers, but one easily operated capstan-type handwheel for fast action. Controls spraying, tank circulation, transfer and draining operations—and filling, too.

**Unobstructed Operator View**—There are no overhanging obstructions to hide the bar. It's fully visible to the operator, allowing immediate on-the-spot adjustments for complete coverage.

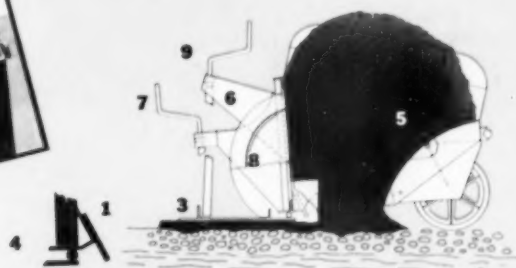
There are many other exclusive Littleford design and operating advantages that make the Spray Master first choice of black top contractors everywhere. For complete information, send for bulletin 14 . . . use convenient airmail reply card below.



## TRUE-LAY PAVER-SPREADER

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# Practical Gradation Limits for Natural Aggregate Bituminous Concrete

By **S. B. Hudson**

Chief Engineer, Miller-Warden Associates

Investigational Work Co-sponsored by South Jersey Construction Company

**T**HE ORIGINAL base construction for about half of the Garden State Parkway in New Jersey was specified as 6-in. of stabilized sand-gravel to be mixed-in-place using either asphalt emulsion or cut-back. Later the specifications were amended to permit hot-mix at the contractor's option. Every contractor involved ultimately elected to use hot-mix. With the exception of a very few yards on the first 2-in. lift in one area, all of the base for the southern half of the Parkway was hot plant-mix material.

Experience with this construction was so satisfactory that it was later specified for not only base but also the surface of some of the service area access roads, and for the surface course of some maintenance parking areas. In each case the total aggregate, both coarse and fine, was bank-run material taken directly from local pits.

The smooth riding qualities of the roadway base before placing the surface course, and the durability of the surface of the parking areas, etc., indicated the possibility of designing a low cost hot-mix pavement, using natural aggregate, for use on secondary roads and streets. The South Jersey Construction Company pioneered in this direction by refining their techniques, using the Marshall method and field experience as the basis for improvement. They have named the product Natural Aggregate Bituminous Concrete (NABC) and since 1954 they have moved an ever increasing tonnage largely for municipal and county roads from their two plants at Chews Landing and Tuckerton, N. J. Some typical jobs with costs are described in this report. Acceptance in competition with the customary low cost construction meth-

ods formerly used is excellent and the indicated overall cost is less for a much superior pavement.

To successfully compete cost-wise with the less durable surface treatments or mixed-in-place construction methods ordinarily used for secondary roads and streets, it is necessary that the gradation specifications be not restrictive to the point where large quantities of materials must be resized or wasted. Therefore one of the purposes of the work presented herein is to establish optimum gradation curves and allowable tolerances for natural aggregate bituminous con-

crete. Another purpose is to foster the better utilization of local materials and to encourage others (largely municipal engineers, county engineers and contractors) to better utilize the well-recognized advantages of hot-plant-mix construction methods—for providing superior and more trouble-free pavements for streets and secondary roads at reduced total overall cost.

## Corps of Engineers Work

The work done by the Corps of Engineers at Vicksburg, Miss., on hot-mix uncrushed gravel pavements has unfortunately received but little recognition in the industry. This work is reported in their Technical Memorandum No. 3-254 which appeared in three volumes

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## Better Quality Control of Cheaper Mixes

Editor's Note: This paper by S. B. Hudson, given at Las Vegas before the National Bituminous Concrete Association, is believed to be of outstanding interest to everyone concerned with getting a better black-top surface for lesser traveled and secondary roads and streets.

There are two chief grades of bituminous concrete, as the technology has shaped up. One is the premium product for heavy duty pavements. It is here that the most effort has been given to technical advancement.

But what of the county, municipal and other agencies who have limited budgets to stretch over large mileages of side roads and local streets, and whose surfaces are going to pieces under the occasional heavy vehicles that get onto them?

In the past the answer for such surfaces has been mixed-in-place construction or surface treatment, and these methods—particularly surface treatment—continue to constitute a very large and widespread activity. The advocates of plant mix, however, feel that

road-mix and treatment work should often give way to hot plant mix, if costs can be kept low enough. The aim would of course be a more durable road, and one able to stand up better under the occasionally heavy axle loads, and better able to come through spring melts and rainy seasons.

The crux of the problem is aggregates. As Hudson spells out, the engineer and contractor can offer a better job, and still a low cost job, if a way can be found to utilize locally available aggregates in non-critical mixes. The single-aggregate mix, as widely used in Minnesota (see recent articles by H. K. Glidden), is an example of this effort.

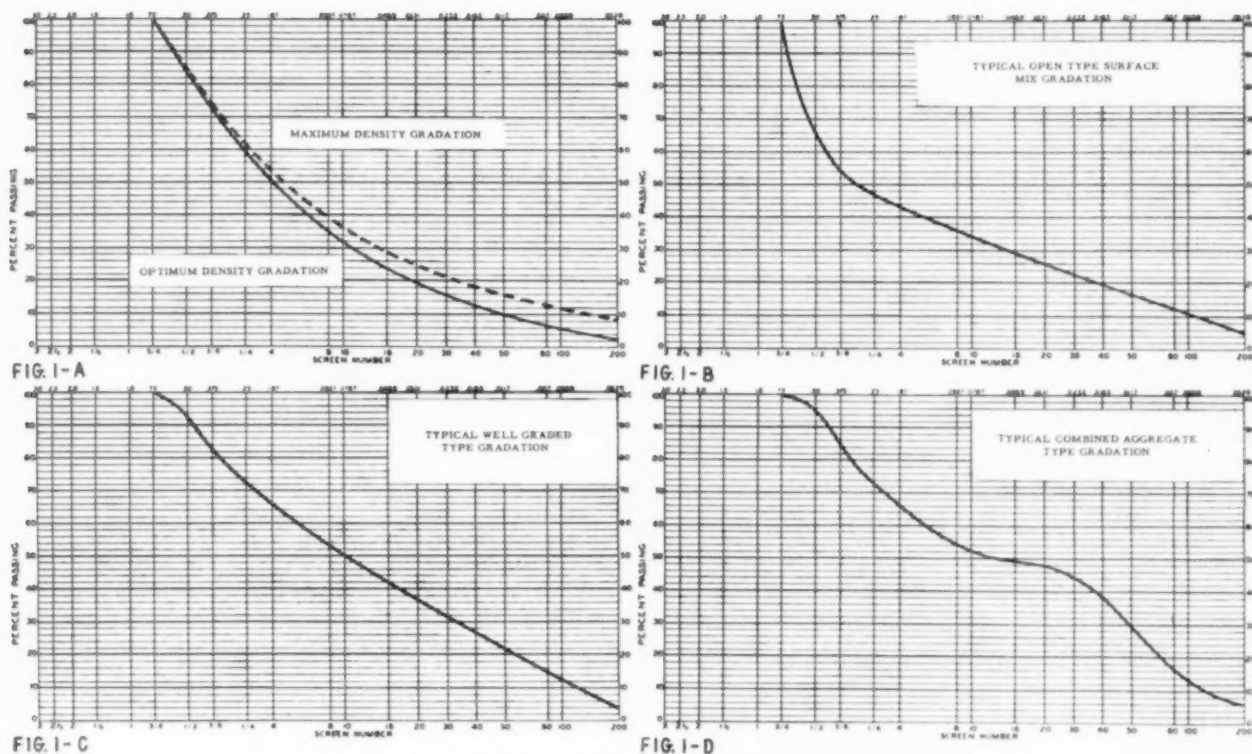
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## Bituminous Articles

in This Issue

Pages 115 to 132

*As presented at the National Bituminous Concrete Association, 3rd Annual Convention, Las Vegas.*



● Fig. 1. Types of gradation curves for bituminous surface mixes, screen opening in inches.

in May, 1948 (2). It consisted of extensive laboratory investigational work, field test installations and traffic testing. It resulted in adoption of the mix design criteria for 100 psi tires shown in Table I.

TABLE I

Corps of Engineers Criteria (100-psi tires)		
Marshall Stability, lb.		500 min.
Flow, 0.01 inches		20 max.
% Voids total mix ( $V_t$ )	Surface	3-5
	Binder	4-6
% Voids filled ( $V_f$ )	Surface	75-85
	Binder	65-75

It will be noted that these criteria were established and traffic tested under wheel loads and tire pressures which exceed by a wide margin the service requirements imposed by vehicular traffic on a highway. Thus these data support the validity of using plant-mix NABC to greater advantage in highway work, and the desirability of establishing practical gradation limits so that local materials can be more economically utilized.

#### Types of Gradation Curves

In theory the specification of gradation bands for bituminous surface courses is an attempt to duplicate prior successful performance. However these bands are often initially developed by applying tolerances to one of four basic types of gradation curves. These are shown in Fig. 1 and compared below.

#### 1. "C" or Maximum Density Curves

Many gradation specifications have been based on the Furnas Optimum Density Curve (Fig. 1A.) or upon various curves which appear as a straight line on a log-log plot. Nijboer (5) found that maximum density was actually obtained when the particle size distribution of the aggregate plotted as a straight line having a slope of .45 on the log-log graph which appears as an inverted "C" on a semi-log graph (Fig. 1A.)

The "C" type gradation curves are suitable for use with slag or all-crushed aggregates having an inherently high voidage, but are not suitable with most sand-gravel aggregates. As the rounded particles have an inherently low aggregate voidage, there is not "room" enough for the bituminous binder and an adequate percentage of air voids.

Gravel mixes of this type of gradation are very critical as to asphalt content and have a history of failure through plastic flow after short periods of service, particularly when used as overlays on concrete pavement. (11), (12). Much of the misunderstanding regarding sand-gravel mixes have derived from attempts to follow the Furnas or the maximum density gradation curve.

#### 2. "L" or Open Gradation Curves

The "L" type gradation is produced by removing a portion of the fines from a naturally graded or crushed aggregate, causing the gradation curve to have a characteristic lazy "L" shape. This type of gradation is probably influenced historically by the specifications for Warrenite Bitulithic pavements. The median gradation for the 3/4-in. maximum Warrenite surface course is shown in Fig. 1B.

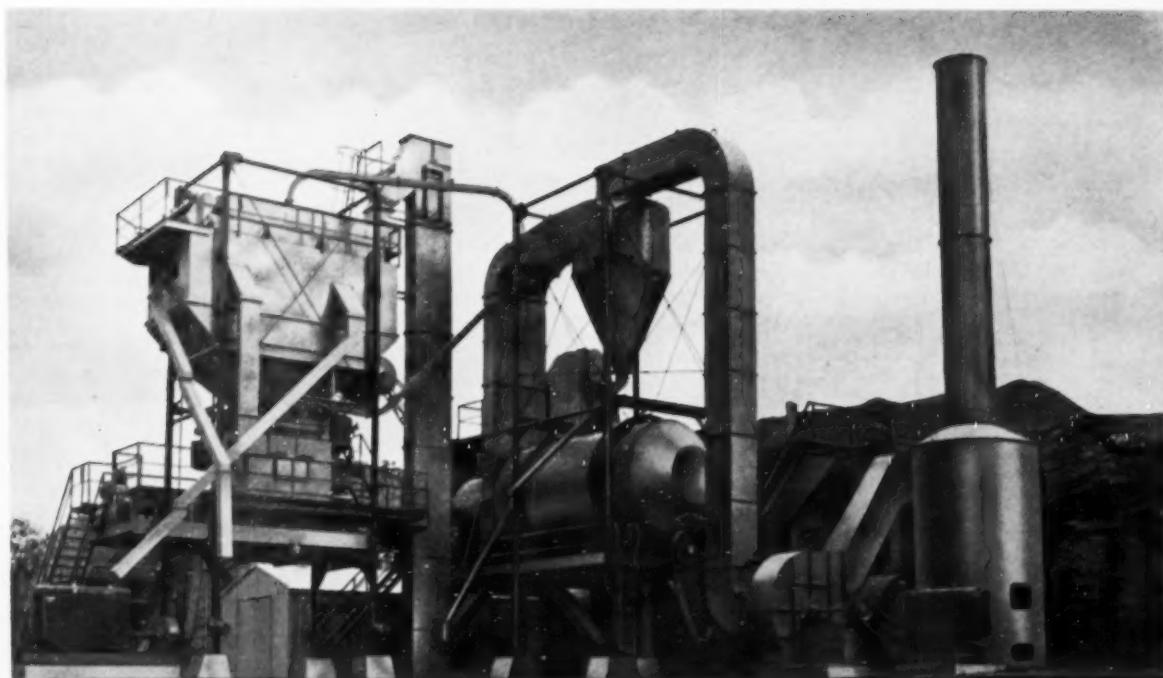
The "L" type of gradations are usually used as binder mixes but in some cases are preferred for surface use. The open textured surface has been claimed to allow water to escape from under the tires of high speed traffic but skidding tests indicate that a "sandpaper" surface is more effective for anti-skid unless heavy dust conditions prevail. This type of gradation is not critical of asphalt content and has a high initial stability. However, there is a tendency for the pavement to lose stability when the point contacts of the coarse aggregate are broken down by heavy traffic.

#### 3. "W" or Well Graded Gradation

"W" or well-graded curves may be developed along the following lines:

If a natural sand or sand-gravel is separated into fractions by a sieve series, wherein the various sieve openings have a definite relationship (as in the fineness mod-

(Continued on page 119)



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## GRADATION LIMITS

(Continued from page 116)

lus series), the distribution of particle size fractions in the frequency histogram will approximate the bell shape of the normal frequency curve. On a semi-log graph this frequency distribution will plot as an "S" curve. If the material is "scalped" or the oversize particles removed and possibly some "dust" or filler material added in, the curve appears as in Fig. 1C.

A natural aggregate gradation of this type was used for base course construction on the Garden State Parkway and for surface course on some of the maintenance parking areas. This type of gradation has also maintained voidage well when subjected to very heavy airfield traffic (channelization) and is probably the general type of curve to be selected for the Columbus, Miss., test. The median of the Corps of Engineers specification limits for surface course for high pressure tires (8) approximate this type of gradation as does the median of the limits for Fine Asphaltic Concrete shown in "Fundamentals of Asphalt Paving." (6). Fortunately it is the type of curve that is frequently approximated in nature, and therefore is the most economical as well as the highest quality type for NABC.

### 4. "M" or Double Humped Curves

A fully developed "M" curve or double humped curve is characteristic of the combination of a nat-



● Parking lot, road and driveways for Pennsauken Mart., Pennsauken, New Jersey. Area paved was over 100,000 sq. yd. This job had many soft clay areas and the owner paid extra to repair these and to rush the job to meet an opening date. Total cost for light grading, 4-in. gravel base and 2-in. NABC was \$1.25 per sq. yd. Previously considered for this job was a 4-in. gravel base, top 2 in. of which was to be mixed-in-place with an MC and single surface treatment.

urally graded coarse aggregate with a naturally graded fine aggregate. This type of curve is also approximated when a selected gradation of coarse aggregate is added to a superior gradation of blended sands such as Richardson's Heavy Traffic Gradation (corrected for modern standard sieves). (9) Fig. 1D.) This type of curve approaches a gap gradation and obtains increased density by eliminating the wedging action of the intermediate size particles. To effectively accomplish this and insure that the maximum size of the fine particles is less than the average size of the voids in the coarse aggregate it is usually necessary to remove one or more size groups in the fineness modulus series from the combined aggregate, i.e., with  $\frac{3}{4}$ -in. to  $\frac{3}{8}$ -in. coarse aggregate and No. 4 to 100 fine ag-

gregate the  $\frac{3}{8}$ -in. No. 4 material would be eliminated. A coarse aggregate graded from  $\frac{3}{4}$ -in. to No. 4 might require the elimination of two (2) size groups or use of No. 16 to No. 100 fine aggregate. (10) Surface mixes of the "M" type gradation are suitable for very heavy highway traffic.

The Fine Aggregate Bituminous Concrete specified by the New Jersey highway department (1) is of this type. This gradation was successfully used as surface course on the Garden State Parkway. However, it is not an economical gradation for NABC as it involves the waste of some of the natural aggregate and addition of expensive blending sand.

This material has given excellent service and was both economical and eminently satisfactory throughout. It was a pit-run aggregate, scalped on the 1-in. screen and with no blending sand or filler added. The straight line gradation is shown in Fig. 2 and compares favorably with the general Type "W" curve previously shown in Fig. 1C.

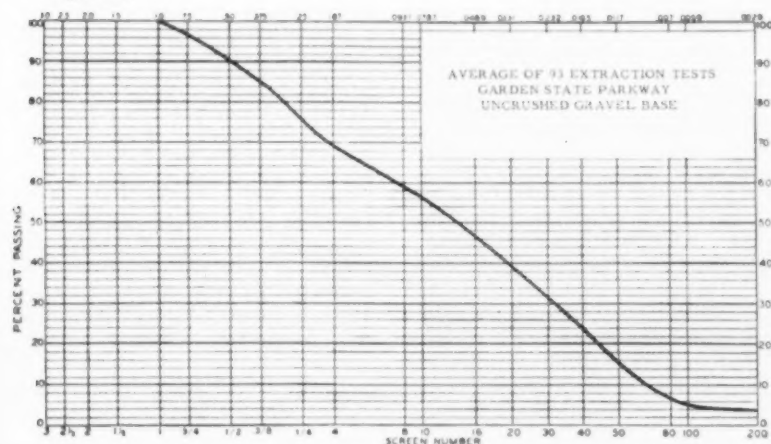
It is obvious that from an economic standpoint that a practical gradation for Natural Aggregate Bituminous Concrete surface mix should approximate a "W" type curve as this involves the least waste or resizing of the material as it occurs in nature.

### Actual Gradation on Garden State Parkway

The average of 93 extraction and Marshall tests from two local pits show the following:

Sieve Size	Gradation	% passing	Physical Test Properties	
1"		100	Stability	1120
$\frac{3}{4}$ "		96	Flow	8
$\frac{3}{8}$ "		85	A.C. by wt. %	5.3
4		69	Total Voids	6.1
10		56	VMA %	18
80		6	Voids filled with asphalt %	67
200		7		

Figure 2



### Development of Optimum Gradation Curve for NABC

Before proceeding with the investigational work on practical limits, one additional step was taken to assure that the basic curve or starting point was well founded. As a review of the various types of gradation curves indicated that an economical gradation must be one of the "W" type, a search of the literature was made for criteria to

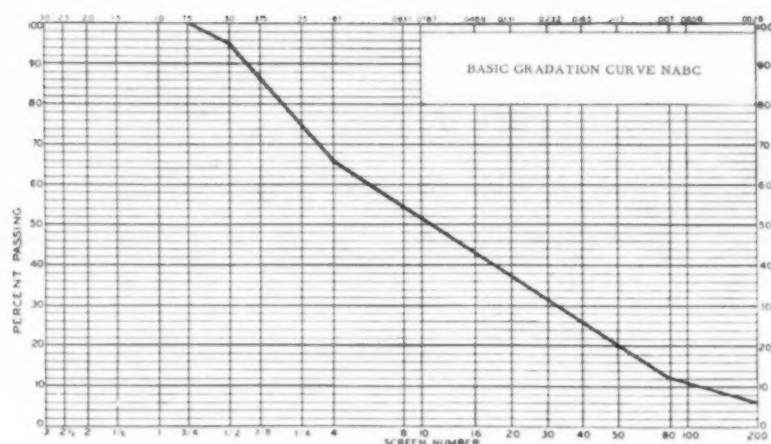


Figure 3

establish a theoretically optimum surface mix gradation of this type to which tolerances would apply.

The Waterways Experiment Station Investigation of the Design and Control of Asphalt Paving

Mixtures (2) indicated that considerable variation could be tolerated and resulted in wide recommended gradation bands for uncrushed gravel asphaltic concrete. (Col. 1, Table 2). It was found that maxi-

TABLE II  
Published Design Criteria—Surface Mixes

	Corps of Engineers TM 3-254 (2) Col. 1	Vokac (3) Col. 2	Hveem (4 & 3) Col. 3	Nijboer (5) Col. 4	Corps of Engineers Inspectors Manual (7) Col. 5
Maximum Size	3/4-in.			3/4-in.	3/4-in.
% Passing 1/2-in.	78-100		75-95 not critical		95
% Passing 3/8-in.	60-94		67-86 not critical		81-86
% Passing 4	48-85		52-69 not critical		61-70
% Passing 10	35-60 (plus 50 pref.)		40-52 minus 70		48-53
% Passing 30	—		31	—	—
% Passing 40	12-37 (a) (26 pref.)	26	22-32	—	—
% Passing 80	7-25		—	—	—
% Passing 200	3-12 (minus 12 pref.)		7-13	4-8	—

(a) Based on 52% Passing #10 (50% of minus—No. 10 aggregate retained #40)

(b) Based on 52% Passing #10 (50% of plus No. 10 passing #40)

(c) Approximation based on average values and F/B ratio 0.3-0.6

(d) Interpolated

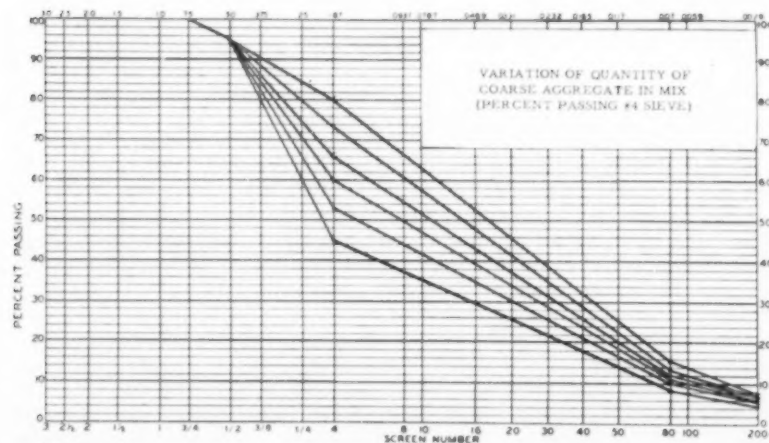


Figure 4

imum stability was attained when up to 50 percent of the total aggregate was retained on the No. 10 sieve. It was also found that increased density and stability were obtained when about 50 percent of the material passing the 10 sieve passed the 40 sieve. Twelve percent filler (minus 200) was recommended as the maximum that should be used, neglecting effects on flexibility and durability.

Vokac (3) found that a non-critical sand gradation was characterized, in a fine sand (100 percent passing No. 4) gradation, by the slope of a line showing 75 percent passing a .0352-in. opening and 25 percent passing a .0077-in. opening. This is equivalent to about 50 percent of the material passing No. 10 passing the No. 40 sieve.

Hveem (4) found that satisfactory gradings tend to pass close to the point represented by the coordinates of 31 percent of the material passing a size equal to 0.031 times the maximum particle size (.0232-in. or No. 30 sieve for 3/4-in. maximum size aggregate). Hveem also indicates critical limits of about 67-86 percent passing an opening of 1/2 the maximum size (3/8-in. for 3/4-in. maximum), not less than about 20 percent passing an opening 0.165 of the maximum size (No. 50) and not more than about 15 percent passing an opening .004 of the maximum size (No. 200).

Nijboer (5) found that adding less than about 30 percent of coarse aggregate had little effect on the mix and that in greater quantities the effect of coarse aggregate was independent of grain size and therefore of gradation. Nijboer noted the great effect of filler (minus No. 200) on the stability of the mix and recommended F/B (Filler-Bitumen) ratios of not less than 0.3 to a maximum of about 0.6. With limestone filler material and 5 percent asphalt by weight this corresponds to about 4-8 percent of minus No. 200.

The Corps of Engineers Construction Inspectors Manual for Flexible Pavements states that, in a 3/4-in. maximum size aggregate surface course mix the optimum percentage passing the 1/2-in. sieve is about 95 percent. Also the optimum percentages passing the 3/8-in. are 81-86 percent, the No. 4, 67-70 percent and the No. 10, 48-53 percent.

From the preceding references Table 2 was established showing all criteria and from which a theoretic-

cal optimum gradation for a 3/4-in. maximum size aggregate surface mix was developed as shown in Fig. 3. Through Hveem's critical point 31 percent passing the No. 30 sieve a line was drawn having a slope corresponding to Vokac's Non-Critical gradation for fine sand (50 percent of material passing No. 10 sieve). This resulted in 52 percent to the total aggregate passing the No. 10 sieve, which is about the optimum for density and stability indicated by the WES investigation (2) and is within the limits of 48-53 percent recommended by the Construction Inspectors Manual (7). The coarse aggregate gradation was then established in accordance with the further recommendations of this Manual which resulted in the general "W" type curve desired.

As this optimum gradation is closely approximated by straight lines from 100 percent at 3/4-in., to 95 percent at 1/2-in., to 66 percent at No. 4, to 12 percent at No. 80

TABLE III  
Asphalt Content Tests on NABC Basic Gradation

(South Jersey Construction Co. aggregates—no added filler)

					Apparent s.g.	
% A. C. (85-100)	4.0	5.0	6.0	7.0	8.0	1.030
% Aggregate	96.0	95.0	94.0	93.0	92.0	2.648
T. S. G. of Mix	2.49	2.455	2.420	2.385	2.352	
B. S. G. of Mix	2.315	2.323	2.345	2.335	2.305	
% Voids (Total Mix)	7.1	5.4	3.1	2.1	2.0	
% Voids (agg. only)	16.1	16.7	16.7	18.0	19.9	
% Voids filled with A. C.	56	68	82	88	90	
Wt. Lb./cu. ft. Total Mix	144.4	145.0	146.3	145.7	143.8	
Wt. Lb./cu. ft. Agg. only	138.6	137.7	137.5	135.5	132.3	
Flow (.01 ins.)	6	6	8	10	15	
Stability (140°F)	1410	1310	1320	940	630	

(Average of 6 individual specimen batches for each per cent asphalt cement)

and to 6 percent at No. 200, this was selected as the basic gradation for the purpose of investigating the effect of variance. This curve approximated that for a scalped natural aggregate closely enough to provide a practical and economical gradation. The physical test prop-

erties of the natural aggregate graded in accordance with the curve of Fig. 3, are shown in Table III. These tests show that the basic gradation is non-critical and that satisfactory voidage and stability can be obtained over a practical  
(Continued on page 132)

## New Solution Aids Wet Concrete-Asphalt Bond

The Dow Corning Corporation reports that laboratory tests have shown the effectiveness of a new silicone solution developed to improve adhesion between asphalt and wet concrete.

The solution, known as Dow Corning 772, is a silicone masonry water repellent which, in this application, is used on the concrete surface in a dilute solution.

In a test illustrating the improvement, a series of concrete bricks was prepared. A standard asphalt emulsion was poured on one end of each of a pair of bricks and allowed 15 minutes to dry. Additional asphalt was then put on one brick, and the two were quickly stuck together. After three hours the bricks were pulled apart manually and examined.

Nine of these brick pairs were prepared and tested. Some of the bricks were treated with solutions of Dow Corning 772 (varying in strength). Some of the bricks were also wetted by a 10-minute immersion in water.

Results of the test show that the new solution improves the adhesion of asphalt to wet concrete, yet does not interfere with the bond of asphalt to dry concrete, according to the company. The tests indicate that 772 may prove valuable as a surface treatment on bridge deck-

ing where an asphalt top coat is to be applied; on old concrete highways which are to be resurfaced with asphalt; and on damaged concrete surfaces prior to patching with asphalt.

In these applications, the company spokesmen say that the solution should not only promote adhesion but should also protect the

concrete from de-icing chemicals and from water that reaches the concrete surface through cracks in the asphalt top coat. It is estimated that a gallon of the solution will cover about 100 square feet.

The company says that Dow Corning 772 also tested effectively in improving adhesion between asphalt and wet aggregate.

## Special Device for Asphalt Leveling Course

Extensive resurfacing work on dual lane highways during 1957 near Bloomington, Illinois, made use of a Blaw-Knox Company-developed correction course attachment with the Bituminous PF-90.

Payne and Dolan, Inc., a bituminous paving contracting firm of Chicago, employed the attachment for paving work on Routes 150 and 66. Extremely bad road surfaces led the Illinois highway department to set particularly exacting paving specifications.

Although the PF-90 features exceptional correction ability in its design, the correction course attachment was developed to give additional road surface correction ability for smoother riding roads. The attachment consists of extension arms from the screed back to the rollers which support the screed from the already corrected surface.



## Understand Your Equipment

... By H. G. Nevitt

FROM a practical standpoint probably the most spectacular advance made by modern road building is the development and use of highly mechanized equipment. Remarkable ingenuity has been shown by manufacturers in building devices which not merely carry on the necessary operations, often highly specialized, involved in building roads, but which also show an extremely high output. The alert contractor can generally credit his profits to the possession and intelligent use of such machinery. We wish to discuss this latter point.

Contractors, like other users of ingenious and more or less automatic equipment, are inclined to take it very much for granted. They seem to feel that the manufacturer has been able to build into the machinery the ability to do the operation exactly as needed in the most efficient fashion. This is true to a certain point. That is, for the assumed design—and presumably most common—situation, the equipment will do the best possible job. However, such a situation rarely occurs exactly as visualized by the manufacturer. On each point where design assumptions are required, he must design for the most likely conditions. Actually, of course, each project varies from this average situation, which means that the equipment designed will not be quite the optimum for it.

We can best bring this out by quoting the remarks of a manufacturer concerning his drier equipment—"so often operators and engineers become enthusiastic about one element in drying and forget that drying performance results from numerous inter-related factors that cannot be treated independently. Size of burner, volume of air flow, dryer length, dryer diameter, dryer flight design, retention time, etc., are parts of total systems and the combination may be varied for different objectives."

What conclusion does this lead to? Merely that the contractor must understand the basic design of the

equipment, the special factors in his problem, and what action, if any, he should take in the light of such understanding. Fortunately for him, manufacturers of equipment are generally able to provide in it a great deal of flexibility, so that if the contractor has knowledge and intelligently applies it, the equipment can be made to perform about as efficiently under the usual conditions as though the design conditions existed. However, many contractors fail to realize this and do not get the most out of the possibilities inherent in their equipment.

### Efficiency Differences

This lack of understanding by some contractors may even go further than this. Since the factor of judgment is involved in each design decision, the piece of equipment finally developed by each manufacturer may represent a different compromise of the needs, and consequently show optimum efficiency under different conditions. This means that on one project machinery from one manufacturer may be more efficient than that from another, while on another project the situation may be completely reversed. If the contractor does not understand this and happens to be working on a project for which his particular purchase is less efficient, he is almost certain to complain about it even though perhaps on the majority of projects he possesses the most suitable piece of machinery.

It should be very evident that every piece of highway equipment reflects not merely the materials and production skills of the manufacturer, but likewise his ability to best estimate the most usual project requirements and correspondingly tailor his design to suit them. It is equally clear that the suitability of a piece of equipment for a particular job, especially if varying considerably from the average, is no indication that it is a better design.

As a rule the reverse will be true, since requirements needed in ordinary situations may be sacrificed to provide efficiency in the less usual circumstances.

We can perhaps emphasize this point by again referring to dryers. Sometime back we discussed drying needs, and pointed out for certain conditions not frequently encountered a long residence time was desirable. If, however, the contractor purchased a dryer of this type for widespread use he would find it less suitable for his usual situation despite its excellent performance with special aggregates.

Obviously the successful contractor must bring a considerable amount of knowledge and intelligence to bear in the use of his equipment, and the more effective the inherent properties built in by the manufacturer, the greater the need for its understanding use by the contractor. Instead of the machinery doing the work unaided, the contractor must realize that more than ever his experience and knowledge of highway building, along with understanding of the functioning of the machinery, are essential to maximum results from his investment.

To some contractors this may be bad news, but in our view it is a very fortunate situation for all concerned. Certainly the ultimate consumer paying for the work will benefit from this requirement, which will be met by the more successful contractors. However, it is even a good thing for the contractor himself. The curse of the business today is that almost anyone with sufficient capital can make a low bid and perhaps be awarded a project. If, however, specialized knowledge becomes increasingly necessary with the development of complex machinery, the possibilities of this type of competition are steadily diminishing, leaving the business where it belongs—in the hands of experts, amply equipped to buy suitable machinery and intelligently able to use it.



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## **BIG BUT PORTABLE — THE MADSEN MODEL 481 ASPHALT PLANT HELPS YOU MAKE MORE PROFITS OVER THE SEASON ON EVERY JOB**

Ability to turn out greater tonnage hour-after-hour plus 100% portability have made the MADSEN Model 481 Asphalt Plant ideal for today's fast-moving highway jobs.

The 481 is oversize throughout including larger elevator, screen, bins, weigh-box, mixer and drives. It is built in 4000-lb., 5000-lb. and 6000-lb. batch capacities. All air operation of bin gates, weigh-box, asphalt injection and mixer gate help to make this plant fast and easy to operate. Fully automatic operation is optional. Features such as the exclusive MADSEN roll-away weigh-box assembly and the externally removable liner sections of the MADSEN Twin-Shaft Pug Mill Mixer... assure easy, low-cost servicing and maintenance.

These are just some of the money-making advantages you get in the MADSEN Model 481 Asphalt Plant. Why not get the complete story on this big capacity, portable plant today.



*Equipment that Serves.*

North, South, East or West... There's a MADSEN Distributor near you to serve you. And, for your convenience MADSEN maintains a complete parts stock in Los Angeles and Lima, Ohio.

## **MADSEN MODEL 481 ASPHALT PLANT**

Ask your MADSEN Distributor for Catalog No. 800-A or write MADSEN Works  
Baldwin-Lima-Hamilton Corporation P.O. Box 38, La Mirada, California

THE MADSEN LINE OF PRODUCTS  
FOR THE ASPHALT PAVING INDUSTRY

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS  
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS  
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

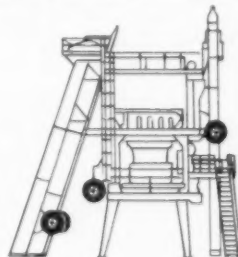


## **MADSEN WORKS**

**BALDWIN-LIMA-HAMILTON**  
CONSTRUCTION EQUIPMENT DIVISION  
DIVISIONS: Austin-Western • Eddystone •  
Electronics & Instrumentation • Hamilton •  
Lima • Loewy-Hydropress • Madsen • Pelton  
• Standard Steel Works

This successful Delaware contractor operates the MADSEN Model 481 4000-lb. Batch Capacity Asphalt Plant shown above at Port Allegany, Pa. On a recent highway job plant produced 25,000 tons of bituminous mix with a daily production rate up to 1500 tons. Compact, unit-construction and complete portability enables owner to quickly dismantle plant, move and set up again... where the big jobs are.

• If desired, screen bin unit, mixer weigh-box section and hot stone elevator may be wheel-equipped at the factory or in the field, as shown below.





## ASPHALT PRODUCTION NOW GREATLY INCREASED AT SOHIO LATONIA PLANT!

The best asphalt service in Ohio is now better than ever!

Sohio's huge refinery at Latonia, Ky. has converted almost 100% of its total capacity to asphalt production exclusively! New modernized facilities will provide larger volume and better service for all asphalt users in Kentucky, Indiana and Ohio.

Sohio's Latonia plant has 15,000,000 gallons of finished asphalt grades storage capacity and can

handle up to 150 trucks per day. That means you don't waste time in line-ups. Sohio's round-the-clock service gives you *all the high quality* asphalt you want, when you want it.

To take advantage of this continuous, dependable asphalt service, call or write Sohio, Asphalt Division, Tennessee Avenue Office, Cincinnati, Ohio.



**ASPHALT**

... for more details circle 323 on enclosed return postal card



● San Ore's "BatchOmatic" hot-mix plant, set up in a state-approved pit immediately adjacent to the Colorado Route 85-87 highway site (see new grade at left).

## INTERSTATE ROAD PROJECTS—

# Colorado's Biggest Hot-Mix Paving Job

*Mix is being produced in a large-capacity automatic plant at 200 to 240 tons per hour for 22-mile dual segment of Route 85-87.*

**T**HE BIGGEST hot-mix paving contract ever let by the state of Colorado finally came to a season's halt on December 21, 1957, as low temperatures forced a shut-down until spring. About 50 percent of the job was completed.

San Ore Construction Company, of McPherson, Kansas, held the contract for subbase, base and surfacing work. For this truly over-size contract, subbase preparations alone require 344,000 tons of material, the base was 208,000 tons, and the intermediate type hot-mix AC leveling and wearing courses total some 162,000 tons. San Ore's bid was \$1,253,000.

The contract, which covered 21.6 miles of new construction and resurfacing between Fountain and Pueblo, Colo., was let unusually late in the season for a job of its size. At the time of the letting, the successful bidder's spread was still

working on the unique asphaltic surfacing of the face of Montgomery Dam, near Alma, Colorado. Even then, weeks before work began on the big contract, snow flurries were seen on more than one frosty afternoon.

Completion in 180 working days is called for. Some 55 days were involved in the completion of the first 50 percent of the job. Work will resume in the 1958 spring as soon as state inspectors give the go-ahead.

● Even when the present contract is completed in 1958, the work on this stretch of U.S. highways 85 and 87 will not be at an end. A 2-in. high-type hot-mix AC surface course, 28 ft. wide for each dual roadway, may not be applied for several years; perhaps not for four years on the basis of anticipated traffic loads.

Part of the Interstate highway system, the site of the new routes 85-87 already exists. In fact parts of the existing roads are being retained as base and simply resurfaced. However, wherever the present road sections have deteriorated seriously, they are being removed entirely and subbase, base and surface courses relaid. Wherever possible, the new route consists of two separated roadways, each with a total width of 38 ft. including outer 10 ft. shoulder.

Subbase material is placed from 4 to 16 in. deep depending on the soil conditions. The maximum size stone permitted in subbase work is specified as being two-thirds the thickness being laid. Fines are limited to from 5 to 15 percent passing the 200 mesh. All of this material is windrowed from trucks, spread by motor graders and rolled.

The base course uniformly 4 in. thick consist of material 100 percent passing ¾-in. and with fines limited to from 3 to 12 percent passing 200. This material, like the subbase material, is dumped from



● Placing a 12 and a 13 ft. spread in echelon. A third 13-ft. feathered lane extends over the outer 10 ft. shoulder area.

the haul trucks, spread with graders and rolled for compaction.

Topping the base is a 2 in. leveling course of intermediate type AC hot-mix 38 ft. wide. This is placed by two Barber-Greene asphalt finishers, working in echelon. Two 13 ft. and one 12 ft. lanes are laid to make the full 38 ft. width.

Following the same mix specifications, the wearing course is then applied 1 in. thick. However, in this case, the outer 10 ft. is tapered from 1 in. to zero for drainage and to provide the shoulder parking area.

● The mix specifications call for the following aggregate gradation:

100 percent passing	$\frac{3}{4}$ in.
50-70	No. 4
35-55	No. 10
5-10	No. 200

Asphalt content is 5 to 8 percent of AC, 120-150 penetration. This material is trucked several hundred miles in from Eldorado, Kansas. Storage for 43,000 gal. of asphalt is maintained on the job site, using one 9,000 gal. and two 17,000 gal. tanks. Heat for the asphalt system is provided by a Hi-Way hot oil heater.

Aggregate for the subbase, base and hot-mix materials is obtained from state-approved pits in the area. It consists of sand, gravel and filler. This mineral material abounds in the area, lying in low hills and hummocks. The topsoil is stripped off and with dozers and front-end loaders, the aggregate is pushed to the bulkhead feeder adjacent to a Cedarapids crusher which reduces the 4 in. maximum size of the raw aggregate to the minus  $\frac{3}{4}$  in. material called for. Aggregate for the

base and subbase material is pit run, taken from selected pits by San Ore, after testing and designation by state inspectors.

Operation of the hot-mix plant, a Barber-Greene Model 896, 6,000 lb. "BatchOmatic", is carried on immediately adjacent to the pit site, with material coming from the crusher over a pre-fabricated conveyor system of San Ore's own construction. One belt, with both horizontal and inclined sections, brings the aggregate from the crusher to a surge stockpile. Material for the plant is reclaimed from this stockpile by an inclined tunnel belt which delivers it to the dryer.

● The plant consists of the conveyor system, the dryer, a 16 cyclone dust collector, and the tower which of course incorporates the screens and pugmill. This is the largest BatchOmatic plant Barber-Greene produces, and capacity-wise is among the largest batch plants produced anywhere. It was brought into the job location from the site of Montgomery Dam, along the Continental Divide in the Rocky Mountains, without incident of any sort. Dis-assembly of the plant at the dam took place on a Saturday, the plant components were trucked to the present site on Monday, and erection was completed by Tuesday.

This B-G tower, incidentally, has been a busy worker in its two years of life. In 1956 it operated on Sections I and II of the Kansas Turnpike, turning out some 130,000 tons of mix. Earlier in 1957 it worked at  
(Continued on page 128)

● San Ore's complete spread near Fountain, Colorado. The conveyors from crusher to stockpile to plant are complete pre-fabricated units, first used on the 1956 Kansas Turnpike job by the same contractor with the same plant. They can be rearranged to make up a wide variety of different aggregate feed systems.







Three Barber-Greene Tamping-Leveling Finishers easily pave over expansion joints jutting 2" high on the 5-mile, 6-lane Calumet Skyway Bridge. The contractor, Armen Avedisian, V.P., The American Asphalt Paving Company, Chicago, said, "All three Barber-Greens did a perfect job, although they are 2, 18 and 19 years old."

## Paving over joints a problem?



As any paver passes over expansion joint, screed rides on joint. This does not interfere with compaction with Barber-Greene Finisher. Independent B-G Tamper compacts material right up to and away from obstruction.

Paving over jutting bridge expansion joints...over protruding manholes...over railroad and streetcar tracks...paving the faces of dams, at angles too steep for negotiating on foot...automobile race tracks, demanding extreme accuracy of surface contour...test tracks with steeply banked, negatively crowned curves...these and many other problems have been successfully solved by the Barber-Greene Tamping-Leveling Finisher for twenty years. The new Model 879-B is establishing even higher standards of performance. Write for information.

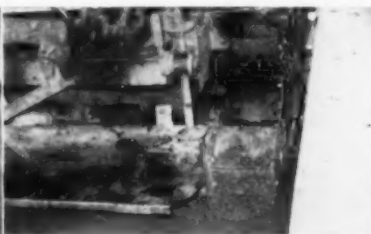
58-35-F



Expansion joints were 2" high. Shown here before pavement was laid by Barber-Greene Finishers.



Bumpometer shows smooth surface, before rolling, even at point where screed was when crawlers passed over joint.



Barber-Greene laid and compacted material right up to concrete curb.

# Barber-Greene



AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

ROADS AND STREETS, May, 1958

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## COLORADO PAVING JOB

(Continued from page 126)

Ellsworth, Kansas, on a 40,000 ton job; then to Montgomery Dam where 20,000 tons more were turned out. At the conclusion of the present job, the plant will have mixed a total of over 350,000 tons since leaving the factory.

Capacities on the present job range from 200 to 240 tph. About 9 trucks, big tandems of 18 ton capacity, haul from plant to paving site.

The state inspectors in Colorado do not require a fixed mixing cycle on batch plant mixes, asking only an adequately coated mix. As a result, San Ore's "BatchOmatic" is working on a 45 second cycle: 10 sec. dry mix and 32 sec. wet mix, the remaining 3 sec. being sufficient for discharge from the pugmill and automatic recycling.

To provide electricity for operation of the plant and other equipment, San Ore brought in two Cat D337 Series F generator plants of 150 KW capacity each.

## Graduate Instruction in Asphalt Paving Technology

A special program of advanced study in asphalt paving technology at graduate level will be offered at A & M College of Texas during the first term of the 1958 summer school. It is being made possible by a grant of \$20,000 from the Asphalt Institute.

This special program of instruction is being offered for the third time in the United States. It was previously offered at Purdue University and at the University of California.

Enrollment is open to engineering instructors from all parts of the country who will be allocated grants-in-aid of \$750 each.

At A & M College of Texas instruction will be conducted by the Department of Civil Engineering and the Texas Transportation Institute. Lectures by nationally prominent paving technologists will supplement regular instruction.

## MacDonald Fund Campaign

A campaign to raise \$1 million for a permanent memorial to the late Thomas H. MacDonald, for 34 years the nation's top highway administrator, was announced recently on the first anniversary of his death. The Thomas H. MacDonald Memorial Fund committee said the money will be used to establish a Chair of Transportation at Texas A. & M. College.

After his retirement as U. S. Commissioner of Public Roads in 1953, "Chief" MacDonald, as he was known, began a transportation research program at the Texas institution which will be continued as a memorial to him.

The Memorial Chair provides for extension of the work Mr. MacDonald had been carrying on for four years at the Texas Transportation Institute at Texas A. & M. Founded with Mr. MacDonald's counsel, the Institute has the purpose of providing leadership in the development of research and education in transportation.

With headquarters in the Ring Building, Washington, D. C., the Organizing Committee is headed by Chairman Pyke Johnson, former president and now consultant to the Automotive Safety Foundation. Contributions should be sent to this address. Amounts however small will be accepted.

## "Our Etnyre 'Black-Toppers' and Hauling Tanks keep us sold"



Two of 22 Etnyre units operated by Central Asphalt Inc., New Hartford, New York. A 1250 FX 400 Style D "Black-Topper" is shown loading 350-degree bituminous material from an Etnyre Hauling Tank equipped with low-pressure burners.

Recently adding two new Etnyre "Black-Topper" Distributors and a new Etnyre Hauling Tank to bring their fleet up to 16 distributors and 6 transports, Central Asphalt Inc. says, "The fine performance and dependability of the units we are operating keep us sold on Etnyre equipment."

Central Asphalt has used Etnyre "Black-Topper" Distributors and Load-Topper Hauling Tanks extensively in the application of all types of bituminous materials throughout their 11 years of successful operation in central, southern, and southwestern New York State.

Etnyre tanks are originally and exclusively designed and made for handling "heavy" materials. Over and over again, the superiority of these tanks in the special service for which they are designed has been proved by substantial users like Central Asphalt. Learn the details *before* you buy another unit! Call your Etnyre dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

SEE YOUR ETNYRE DEALER

**ETNYRE**  
**"Black-Topper"**  
BITUMINOUS DISTRIBUTORS

... for more details circle 266 on enclosed return postal card



here . . . without a doubt . . . is the most useful buying catalog in your office

. . . and here are some reasons why you should be USING IT DAILY!

- Catalogs are PREFILED — Saving you time and space required to file individual manufacturers' catalogs.
- Saves you the time and inconvenience of writing to manufacturers for catalogs.
- Gives you all the facts needed BEFORE you make a buying decision.
- Manufacturers' names and trade names indexed alphabetically for quick reference to individual catalogs.
- All the buying information is 'boiled down' — designed for your convenience.

After checking the advantages listed above, you can see why this ONE CATALOG offers you so MANY advantages . . . saving you both time and money, not only in the mechanical and physical aspects of a cataloging operation . . . BUT MOST IMPORTANT OF ALL . . . it is available WHEN you NEED it . . . BEFORE you make your buying decisions! The manufacturers represented in this catalog are literally 'meeting' with you in your office — offering you all the information you could possibly need concerning their products. Why not meet them at least half way — and USE THEIR PREFILED INFORMATION!



Here are the manufacturers represented in Gillette's Heavy Construction Prefiled Catalog:

American Steel & Wire  
Armco Drainage & Metal Products,  
Inc.  
Austin-Western

Baldwin-Lima-Hamilton Corporation  
Barber-Greene Company  
Browning Manufacturing Company

Carey Manufacturing Company,  
The Philip  
Chrysler Corporation,  
Industrial Engine Div.

Clark Industries  
Cleaver-Brooks Company  
Cleveland Form Grader Co., The  
Cleveland Trencher Co., The  
Colorado Fuel & Iron Corp., The  
Continental Motors Corporation  
Cummer & Son Co., The F. D.

Detroit Diesel Engine Div.

Erie Strayer Company

Flexible Road Joint Co., The

Ger-Bro Manufacturing Co.  
General Motors Corp.  
Giedhill Road Machinery Company,  
The

Harnischfeger Corporation  
Holtzel Steel Form & Iron Co., The  
Huber-Warco Company, The

Jackson Vibrators, Inc.  
Joy Manufacturing Company

Miller-Tilt-Top Trailer Company  
Minneapolis-Moline Company

Naugatuck Chemical Div.

Onan & Sons, Inc., D. W.  
Owen Bucket Company, The

Phoenix Products Company  
Pioneer Engineering  
Pressite-Keystone Company

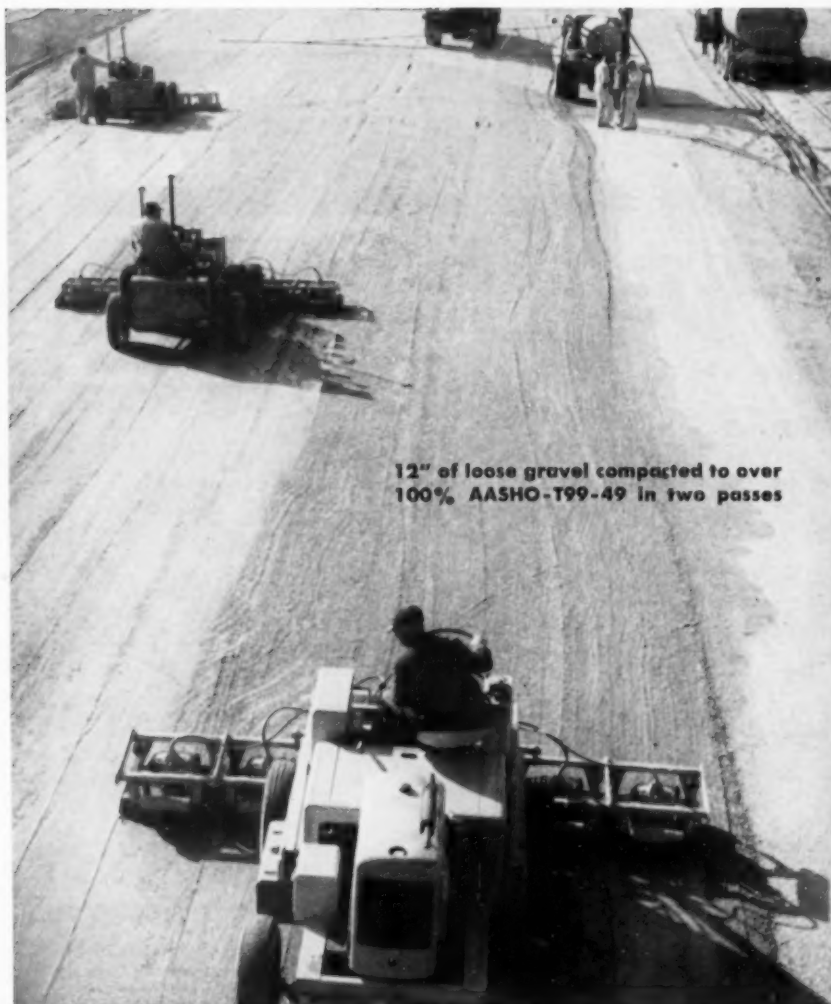
Republic Steel Corporation  
Rogers Brothers Corporation  
Rogers Dozer Rippers

Seaman-Andwall Corporation  
Seaman-Gunnison Corporation  
Servicised Products Corp.  
Shawnee Mfg. Co., Inc.  
Stow Manufacturing Co.  
Symons Clamp & Manufacturing Co.

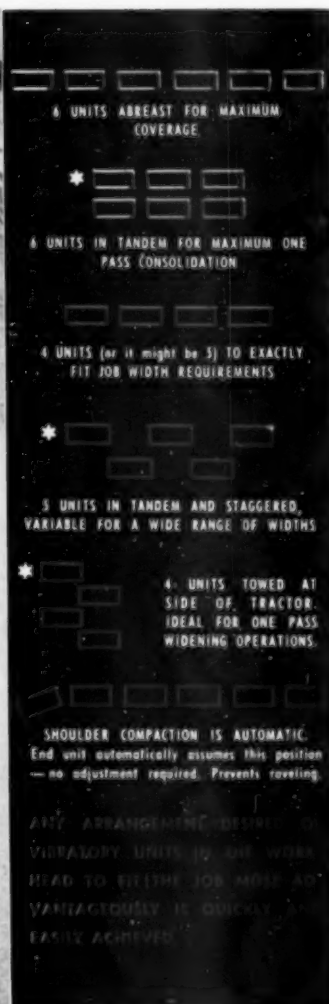
Timken Roller Bearing Co., The  
Towcan Culvert Manufacturers  
Association

United States Rubber Company  
United States Steel Corp.  
Universal Form Clamp Company

Waukesha Motor Company  
Williams Form Engineering Corp.



12" of loose gravel compacted to over 100% AASHTO-T99-49 in two passes



\*Attainable with optional equipment.

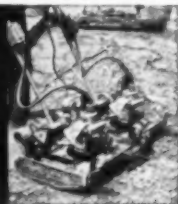
# JACKSON COMPACTORS

**MORE OF THEM USED ON  
AMERICAN TURNPIKE  
PROJECTS THAN ALL  
OTHER PAN-TYPE  
COMPACTORS COMBINED!**

The reason is two-fold. 1. The JACKSON, with its tremendously powerful vibratory action, provides 100% of specified density of any material normally used in macadam base or sub-base courses in the shortest possible time. Each unit in the workhead supplies 4200 THREE-TON BLOWS per minute. 2. IT'S FAR MORE VERSATILE THAN ANY OTHER COMPACTOR, ideally adjustable to each and every job requirement. Coverage is what you want it to be, up to 13', 3". Any arrangement of the compactor units, as indicated at right, is quickly attainable. With this machine you can compact areas others can't touch, a factor that eliminates lost motion and saves a great deal of time and money. And, of course, it is equally effective on all types of granular soil fills and similar projects. By all means inspect it at your Jackson distributor.

## AND FOR SPOTS OTHERS CAN'T REACH

Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.



FOR SALE OR RENT  
AT YOUR JACKSON DISTRIBUTOR  
— name and descriptive  
literature sent on request.

**JACKSON VIBRATORS, INC.**  
LUDINGTON • MICHIGAN

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## Name Your "Hard to Coat" Aggregate



CALIFORNIA  
MARBLE CHIPS



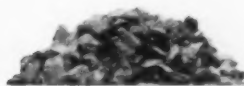
OHIO  
REFERENCE GRAVEL



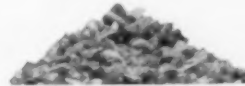
MARYLAND  
REFERENCE GRAVEL



PENNSYLVANIA  
REFERENCE STONE



MASSACHUSETTS  
RHYOLITE



OREGON  
CRYSTAL SILICA

## NEW CATIONIC BITUMULS

- Treats Most Aggregate... Especially  
"Treacherous" Types Such As Shown Here
- Protects Your Cold-Mix Pavements and  
Surface Treatments Against Early Rains

CATIONIC Bitumuls,<sup>®</sup> our new, cold-applied asphalt emulsion, is a truly versatile binder with a "native" affinity for all aggregate, even damp, slick, "hard to coat" gravel and other hydrophilic stone. It also sets more rapidly than conventional road emulsions.

This combination of properties offers definite advantages to the Roadbuilder:

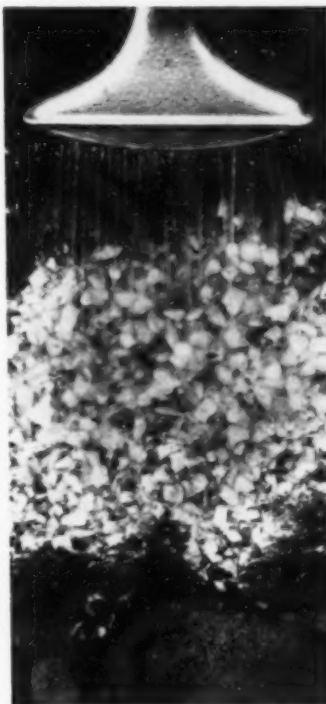
Wider selection in the use of local, often lower-cost, aggregates.

Extended working season . . . better protection against sudden showers.

Faster set permits early rolling of coarse aggregate mixes, and fast opening of pavement to traffic.

Storage, handling and application are much the same with CATIONIC Bitumuls as with conventional emulsions; however, care must be exercised in the preparation of storage facilities and application equipment.

CATIONIC Bitumuls is available from certain of our strategically located plants. Our engineers are ready to discuss projects which you may wish to set up for trials of this new product with specific types of aggregate.



Proof . . . the superior coating and holding properties of new CATIONIC Bitumuls are clearly demonstrated in this test. Note the almost-complete wash-out of the conventional road binder (left); while CATIONIC Bitumuls (right) firmly holds the crystal-silica chips used for these test mix samples.

. . . for more details circle 236 on enclosed return postal card



**American Bitumuls  
& Asphalt Company**

320 Market, San Francisco 20, Calif. Perth Amboy, N. J.  
Baltimore 3, Md. St. Louis 17, Mo. Cincinnati 38, Ohio  
Mobile, Ala. San Juan 23, P. R. Tucson, Ariz.  
Inglewood, Calif. Oakland 1, Calif. Portland 8, Ore.

## GRADATION LIMITS

(Continued from page 121)

range of asphalt content with this aggregate.

### Plant Production of NABC

In production of NABC the pit run material is usually fed through a bar-screen, to remove roots and large stones, directly to the dryer. In the plant the material is fed through a 1 in. or  $\frac{3}{4}$  in. scalping screen and a  $\frac{3}{8}$  in. or  $\frac{1}{2}$  in. intermediate screen. To maintain screening efficiency a  $\frac{1}{4}$  in. or No. 4 fine screen is usually used rather than a No. 6 or No. 8 for the fine aggregate bin.

With this type of gradation unit, control is possible at the following points:

1. Maximum size of coarse aggregate is controlled by size of scalping screen.
2. Quantity of: Max. size to  $\frac{1}{2}$  in. is controlled by batch weight.
3. Quantity of:  $\frac{1}{2}$  to No. 4 is controlled by batch weight.
4. Quantity of: Fine aggregate is controlled by batch weight.
5. Gradation of: Fine aggregate is controlled by addition of fine blending sand at cold feed or boot of hot elevator.

6. Quantity of: minus 200 is controlled by feedback from dust collection and by addition of filler material by batch weight.

Close tolerances at any of these points which differ from the average gradation of the material will result in wasted aggregate or added expense for the purchase and feeding of blending sand and/or filler. In the interest of economy, gradation limits should be specified which will insure a satisfactory mix, but which do not require unnecessary changes in the normal gradation after scalping of the natural aggregate as it comes from the pit.

### Program and Procedures For Establishing Limits

To establish practical gradation limits for NABC it is necessary to determine the effect on the physical test properties of variation in:

1. Quantity of plus No. 4 aggregate
2. Gradation of minus No. 4 material (fine aggregate)
3. Quantity of filler

To utilize local materials to best advantage it is desirable to determine just how far one can deviate from the basic gradation curve (Fig. 3) without running into

trouble. The program therefore consists of independently varying each of these factors over the full practical working range to establish sensitivity and the necessary tolerance limits for maintaining a satisfactory quality mix for the intended service.

A convenient tool for measuring No. 2, gradation of the minus No. 4 aggregate, in the laboratory is the split on the No. 20 sieve and practical control is attained in the plant by the addition of fine blending sand, if required. The quantity of filler is the minus 200 incorporated naturally plus the feedback or added filler. The amount of plus 4 material is, of course, on plant bin control. Thus it will be noted that this program is based on points which are subject to practical control in a commercial plant.

To investigate these variables in relation to the theoretically optimum gradation curve specimens were tested by use of the Marshall Method. The procedures used were:

1. All aggregates were obtained from the hot bins of the South Jersey Construction Co. commercial plants at various times over nearly a two-year period. This method of sampling caused the tests to reflect the effects of normal source variations as shown by the stability level and average density of the different Series. It will also be noted that all aggregates had been through a commercial dryer and thus had the advantage of the improved surface characteristics normally imparted by commercial drying over laboratory drying.

2. All aggregates were rescreened in the lab and then combined in proper proportions to give the desired gradation for each Series.

3. The single batch method was used for the preparation of each Marshall specimen.

4. A minimum of five (5) specimens, each made on a different day, was used to establish each individual point. Thus each point is the average of at least 5 independent test results.

5. All specimens were made at or close to optimum asphalt content for that particular gradation.

6. Compaction for all specimens was 50 blows of the Marshall hammer on each side.

7. Care was taken to uniformly control mixing time and temperature, compaction temperature (250°F), pedestal reaction, etc., to minimize variation due to testing techniques.

## L-20 White ASPHALT PLANT PAYS FOR ITSELF IN 38 DAYS!\*



\* \$13,900 F.O.B. Elkhart is price of portable model illustrated. Stationary model, \$13,400 F.O.B. Complete, ready to operate. Prices subject to change without notice.

Make your own hot mix asphalt with this new WHITE plant and save up to \$2.30 a ton. At its capacity of 160 tons an 8-hour day, that's a savings of \$368.00 a day. Thirty-eight of those days pays for the L-20!

Produce any type mix you can get from a \$100,000 plant: hot, RC, MC, SC and emulsified for top

course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 325 degrees.

The L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance.

See your nearest distributor or write direct for full information.

**White Manufacturing Company, Elkhart 2, Indiana**

... for more details circle 338 on enclosed return postal card

## New Products

(Continued from page 111)



Wash-Down System on Truck Mixer

### Truck Mixer Wash-Down

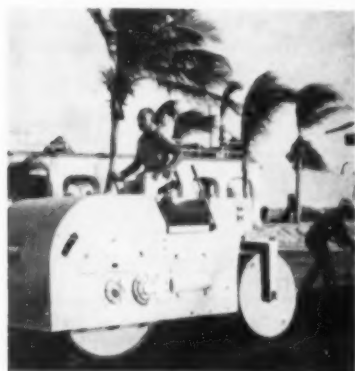
An automatic wash-down system for the discharge assembly has been introduced as standard equipment on all 1958 truck mixers of the Challenge Manufacturing Co. By simply turning a valve, after the discharge of each load of concrete, a hard, sharp spray of water knocks off all loose concrete from the rear cone section of the drum, the collecting hopper and the rear discharge fins, cleaning all the "hard-to-reach" places so frequently neglected or overlooked when washing the mixer.

Challenge Manufacturing Co., 7400 E. Bandini Blvd., Los Angeles, Calif.

For more details circle 130 on Enclosed Return Postal Card.

### 3-5 Ton Tandem Roller

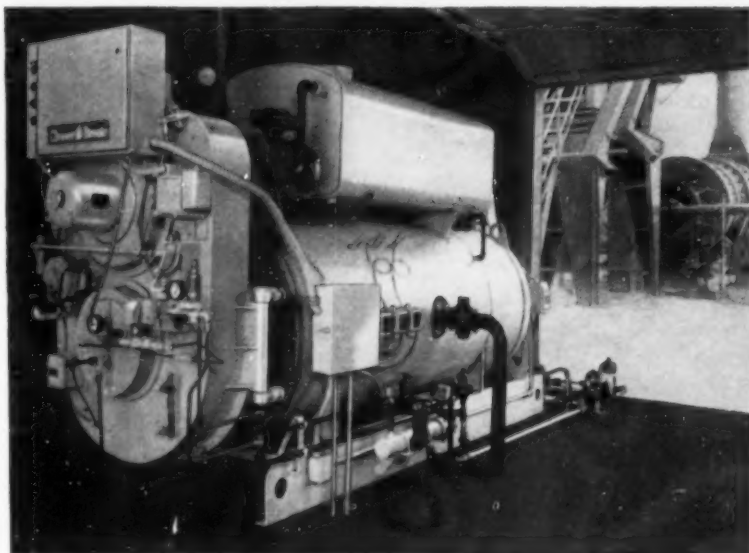
Two exclusive major improvements have been added to the 3-5 ton tandem roller of Huber-Warco. The addition of a tail-shaft governor, in connection with the torque converter, permits the operator to maintain a pre-selected rolling speed, regardless of grade, without touching the hand throttle. There is no need to adjust the hand throttle as steeper or lesser grades are encountered.



Huber-Warco 3-5 Ton Roller

ROADS AND STREETS, May, 1958

## New PEAK / TEMP forced-circulation uses high-temperature oil



## Heats bitumins twice as fast as 150 lbs. steam!

New Peak-Temp forced-circulation oil heater does away with costly high pressure steam lines, valves, boilers. Heated high-flash-point oils circulate, raise and maintain bitumins and heavy viscous materials to application temperatures—increasing at the rate of 25 to 30° per hour. That's about twice as fast as with 150 lbs. of steam.

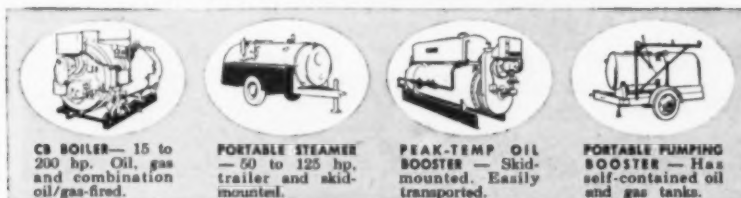
- Forced circulation provides uniform heat distribution. No carbon build-up or coking.
- Circulating oil lasts indefinitely — won't freeze in spring and fall operation.
- No refractory in furnace to replace or maintain. No stack.
- Heats oil to 450° F. without special pumps and fittings.

- Operates at atmospheric pressure — minimum attention and maintenance.
- Completely automatic — fully equipped with advanced operating and safety controls. Quiet, smokeless.

**Versatile** — easily adapted to heating a variety of viscous materials — such as plastics, residuals. Handy for quick drying of forms used with cast prestressed concrete structural members. Completely fiber glass insulated and metal-jacketed.

For complete details write for Bulletin C-11. Cleaver-Brooks Company, Road Machinery Division, Dept. F, 395 E. Keefe Ave., Milwaukee 12, Wis.

**Cleaver  Brooks®**  
ORIGINATORS OF THE SELF-CONTAINED BOILER



**CB BOILER** — 15 to 200 hp. Oil, gas and combination oil/gas-fired.

**PORTABLE STEAMER** — 50 to 125 hp. trailer and skid-mounted.

**PEAK-TEMP OIL BOOSTER** — Skid-mounted. Easily transported.

**PORTABLE PUMPING BOOSTER** — Has self-contained oil and gas tanks.

... for more details circle 258 on enclosed return postal card

tered. The tail-shaft governor also allows more use of the engine compression as a braking factor on exceptionally steep grades.

Another important feature is the addition of a foot-operated brake located on the transmission output shaft. This new Ausco-Lambert disc-type brake replaces the former hand operated contracting band brake on the compression roll. It will lock the drive roll with very little pressure applied to the brake pedal.

Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio.

For more details circle 131 on Enclosed Return Postal Card.



PAVING PROFITS GO UP WHEN YOU USE

## OVERMAN'S STONE AND BITUMINOUS SPREADER

You can do fast, high-quality paving with this small, compact, low cost machine. Lays any type commercial asphalt. Easily handled on small jobs, highly efficient on the largest job. A proven money-maker for contractors and highway departments everywhere. Get the facts . . . write for descriptive bulletin today.

**I.J.OVERMAN MANUFACTURING CO.**  
**BOX 896 MARION, INDIANA**

... for more details circle 312 on enclosed return postal card

**SWENSON**  
**SPREADERS**

**Speed Sealcoating!**

Spreads Salt or Chloride  
for **DUST CONTROL** or  
**SOIL STABILIZATION**

write for complete  
information  
**SWENSON SPREADER  
& MFG. CO.**  
Lindenwood, Illinois

... for more details circle 324 on enclosed return postal card

### Front End Loader

An entirely new "Payloador" Model, the H-25, announced by The Frank G. Hough Co., has a rated carrying capacity of 2,500 lb. It has a combination of new design features that are expected to establish new standards of production and ease of operation.

A new power-shift transmission and new torque-converter are matched to provide the maximum in speed of movement and ease of operation. The transmission is full-reversing and has two speeds. Another feature of the power-train is the power-transfer differential which automatically transfers more torque to the drive wheel with the best footage when slippage is encountered.



Model H-25 Payloador

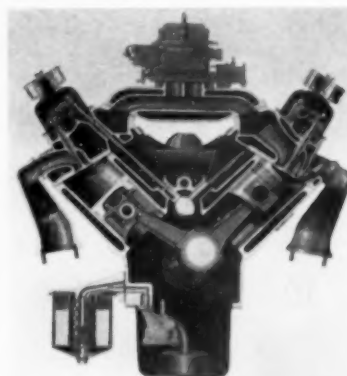
This new "Payloador" is being offered with a choice of gasoline, diesel or LPG power.

Frank G. Hough Co., 973 Seventh Ave., Libertyville, Ill.

For more details circle 132 on Enclosed Return Postal Card.

### 4 New Industrial Engines

With the addition of three new gasoline models and one six-cylinder diesel, Ford Motor Company now offers a full line of ten basic industrial engines with displacements ranging from 134 cu. in. to 534 cu. in., thus nearly doubling its range of gasoline and diesel engines for mobile and stationary powered equipment.



Cross Section of Ford's New 534-cu. in. Gasoline Industrial Engine

For the gasoline engines the brake horsepower of the "534" is 252 at 2,800 rpm, with a torque rating of 492 ft.-lb. from 1700 to 2200 rpm. For the "447" has 226 hp at the same engine speeds and a torque rating of 431 ft.-lb. from 1700 to 2400 rpm. The "401" has 185 hp and a torque rating of 351 ft.-lb. from 1700 to 2400 rpm.

The "330" diesel has a bore and stroke of 3.94 x 4.52, and a compression ratio of 16 to 1. The dynamometer brake horsepower is 96 at 2250 rpm, with a torque rating of 236 ft.-lb. at 1600 rpm.

Ford Division of Ford Motor Company, Southfield Road at Rotunda Drive, Dearborn, Mich.

For more details circle 133 on Enclosed Return Postal Card.



## Vibrating Screen

A "Whizzer," single and double-deck vibrating screen for attachment to belt conveyors and bucket loaders has been announced by Universal Engineering Corp. A "circle-throw" type screen, the arched screen deck spreads material across the entire width of the screen cloth. It has controlled vibration for maximum output. It can be driven from head shaft of conveyor. No separate power is needed. Twelve sizes of single-deck and double-deck are available from 4 ft. x 24 in. to 8 ft. x 42 in.

Universal Engineering Corp., 625 "C" Avenue, N.W., Cedar Rapids, Ia.

For more details circle 134 on Enclosed Return Postal Card.

## 70-Ton Truck Crane

Combining heavy-duty capacity with a 200-ft. lift and a high degree of mobility, the all-new 70-ton P & H 775-TC features "Magnetorque" swing, the exclusive P & H frictionless clutch mechanism for safer, smoother swing action. Direct action hydraulic controls assure accurate spotting of all loads at a 15-ft. radius. Removable front and rear outriggers and counter weights provide maximum weight reduction for fast job-to-job moves.



70-Ton P & H 775-TC Crane

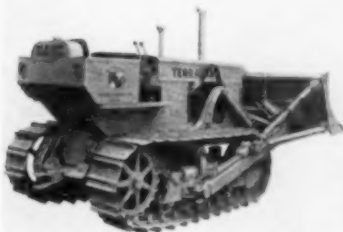
The new crane is either gasoline or diesel powered and mounted on an 8-wheel, 4-wheel drive, P & H diesel powered crane carrier. Dimensions of the carrier 33 ft. long, 11 ft.  $\frac{3}{4}$  in. wide 13 ft. 4  $\frac{1}{8}$  in. high to the top of the cab.

Harnischfeger Corporation, Milwaukee 46, Wis.

For more details circle 135 on Enclosed Return Postal Card.

## Power Dozer Blades

Hydraulically operated dozer blades that can be angled in seconds—while the tractor is in motion—are now available on all Case "Terratracs" crawler tractors. Job-proved for over a year on the company's larger crawlers, the power-angling feature is now standard equipment on the 62-hp Model 600 and 50-hp Model 500 "Terratracs", and optional on the 42-hp Model 320, smallest crawler dozer in the Case industrial line. For angle control, the operator merely presses a lever on the dash. An adjacent lever enables him to raise and lower the blade with the same hand.



Model 500 50-HP "TerraTrac"

Principal advantage of power-angling, the company claims, is that the operator has precise control of blade angle at all times.

J. I. Case Company, Racine, Wis.

For more details circle 136 on Enclosed Return Postal Card.

## GRACE



3 sweeper models, axle, engine or tractor powered.



Sheepsfoot Rollers  
250 to 600 psi.

## GRACE Asphalt and Compaction Equipment



Rapidspray Maintenance Distributors.  
Also heaters for production melting of barreled asphalt.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Pneumatic rollers 7 to 50 tons.

## W. E. GRACE MFG. CO.

6007 S. Lamar Street  
Dallas, Texas

... for more details circle 276 on enclosed return postal card



## FOR 17¢ PER SQUARE FOOT

"Codit" Reflective Liquid goes on fast by brush or spray. Hazards flash their own bright warning at night for safety. Reflectivity lasts up to 2 years. Buy your supply from your 3M Representative or write 3M Company, Dept. NR-58, St. Paul 6, Minnesota.



Get Codit Reflective Liquid in 6 oz. aerosol spray, 5 lb. can, or in complete safety kit.

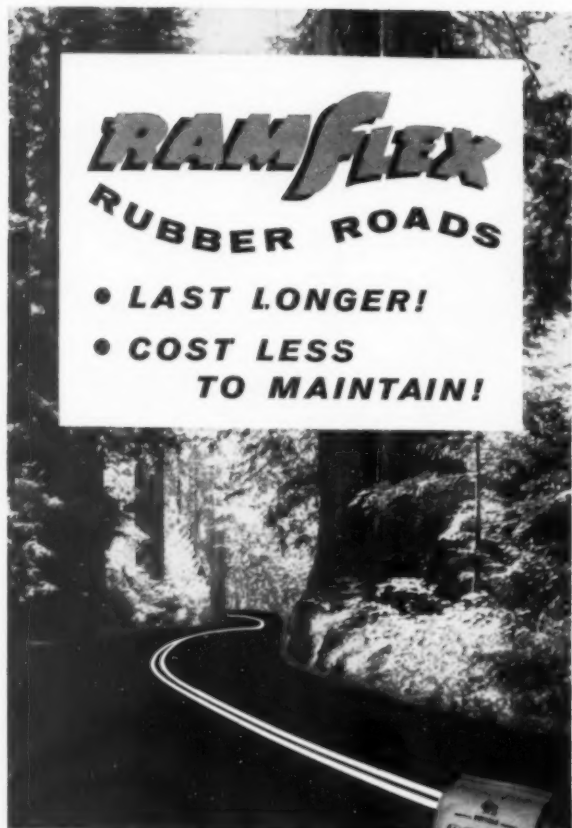


... for more details circle 306 on enclosed return postal card

ROADS AND STREETS, May, 1958

# RAMFLEX RUBBER ROADS

- **LAST LONGER!**
- **COST LESS  
TO MAINTAIN!**



**RAMFLEX is the new Rubber Additive that mixes with REGULAR ASPHALT to create "rubberized pavement".**

RAMFLEX requires no special equipment and the paving mixture spreads rapidly, evenly and uniformly. The paving won't "shove" after placed, resists cracking in cold temperatures, and "bleeding" in hot weather. Stripping and raveling of road edges is reduced to a minimum. In addition, hot patches last far longer when made with RAMFLEX. This all means lower paving costs and practically NO maintenance.

All these advantages have been PROVED on successful state, county, city and private paving installations. Why don't you be the one to introduce the revolutionary new RAMFLEX Rubber Road to your local paving program. Regular contractors do the paving... we supply the RAMFLEX in convenient size bags. Write for the money saving facts, today.

*Send for this illustrated*

## FACT FOLDER

Every paving contractor, every government official connected with paving programs should read this informative folder.

# U.S.

**RUBBER RECLAIMING CO., INC.**

P. O. BOX 365

BUFFALO 5, NEW YORK

... for more details circle 333 on enclosed return postal card

## Equipment Dynamometers

Dynamometers for checking power characteristics of tractors and other off-highway equipment without removing engine from the chassis, and for dynamometer run-in and test of basic engines and power units have been demonstrated at El Monte, Calif. and will soon be in production, according to current announcement.

Units will cover the power range of all popular tractor models with engines rated up to 450 hp and developing up to 1800 lb. ft. torque at 1000 rpm at the proper take-off, and all basic engines and power units with mechanical clutches or torque converters rated up to 700 hp, developing up to 2600 lb. ft. torque from 1000 rpm and weighing up to 24,000 lb.

Clayton Manufacturing Co., El Monte, Calif.

For more details circle 137 on  
Enclosed Return Postal Card.

## Base Station Amplifiers

Two base station amplifiers, added to GE's new line of high-powered communication equipment, are designed to provide up to 330 watts of power and to greatly increase the signal transmittal from the dispatcher's position in a two-way radio system.

The two latest models, for users in low and high band frequencies (25-54 and 44-174 mc), join the 250-watt UHF highpower station announced in December. In all three bands, the units are engineered to provide increased coverage and to improve reception in vehicles traveling at great distances from the transmitter.

General Electric Communications Products Department, Electronics Park, Syracuse, N. Y.

For more details circle 138 on  
Enclosed Return Postal Card.

## Concrete Truck Mixer

Two new lines of concrete truck mixers, announced by Worthington, feature heavy-duty transmission designs. The "Fleetbuilder" model is driven through a heavy-duty sliding gear transmission in conjunction with a master clutch to control forward and reverse rotation of the mixer drum. Standard twin disc clutches are used in the "Fleetmaster" model for controlling forward and reverse rotation of the drum.

Spiral bevel gears in both the "Fleetmaster and Fleetbuilder" transmissions are oversized and placed at the input end of the transmission for most efficient operation at normal engine speed. The "Fleetbuilder" and "Fleetmaster" lines are each available in eight sizes ranging in capacities from 4 cu. yd. to 9 cu. yd.

Worthington Corporation, Concrete Machinery Division, Plainfield, N. J.

For more details circle 139 on  
Enclosed Return Postal Card.

## Forming Accessories

The Dayton Sure-Grip and Shore Co. has added nut washer and handle washer ties to its line of concrete forming accessories. The nut washer assembly consists of two 3/4 in. outside stud rods and two nut washers. There are 10 in. of thread on the stud rods so contractors can use number of various dimensions in the forming.

The Dayton Sure-Grip & Shore Co., Kercher St., Miamisburg, O.

For more details circle 140 on  
Enclosed Return Postal Card.

## Industrial Truck Lift

Yale & Towne has announced the development of lift truck channels applicable to a 10,000-lb. capacity Yale gasoline truck which can raise a 4000-lb. load to a height of 30 ft. for specialized handling jobs and maintenance work.

The extra high channels have an overall collapsed height of 220 in.

In developing the 30 ft. lift, Yale engineers also determined higher load capacities for lower lifted heights, typical of which are 5300 lb. to a height of 300 in., 6600 lb. to 240 in., and 8000 lb. to 180 in. Lifting speeds of 20 ft. per minute are loaded and 21 ft. per minute empty are possible.

Yale and Towne Manufacturing Co., 11000 Roosevelt Blvd., Philadelphia 15, Penna.

For more details circle 141 on  
Enclosed Return Postal Card.

## Aluminum Hoists

A completely new line of light weight aluminum electric hoists has been introduced by the Coffing Hoist Division of Duff-Norton Co.

Models range from 1/4 ton to 2-ton capacities, and feature mechanically interlocked push button controls. For convenience in pulling a trolley mounted hoist, the control cord incorporates a strain cable. The plastic control station is shaped as a "pistol grip" so that the operator can pull the trolley-mounted hoist and depress the buttons with his thumb at the same time. Control circuits are only 115 volts, regardless of hoist voltages.

Coffing Hoist Division, Duff-Norton Co., Danville, Ill.

For more details circle 142 on  
Enclosed Return Postal Card.

## "Roadpacker" Engines

The Lima vibrating "Roadpacker" for base and subbase construction is now available with either of two models of gasoline or two models of diesel engines to meet varying job conditions and contractors' and market preference in the U. S. and abroad—International gasoline Model L-264-6, Waukesha gasoline model 195 G-KU, Waukesha diesel model 195 D-LCU, and General Motors diesel Model 3-71 (3031).

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

For more details circle 143 on  
Enclosed Return Postal Card.

## Concrete Curing Agent

"Crete-Cure," a white pigmented concrete curing membrane having high dispersive characteristics has been developed by Thiem Products Inc. Advantages claimed are that compounded particles of material are dispersed or given greater suspension, resulting in a heat-reflectory, curing agent that offers the maximum in moisture retention and is less apt to clog or contaminate spraying equipment.

Thiem Products, Inc., 9800 West Rogers St., Milwaukee 19, Wis.

For more details circle 144 on  
Enclosed Return Postal Card.

## Aluminum Road Signs

New aluminum highway signs, announced by Alcoa, are stated to be the first to combine the advantages of aluminum sheets with its flatter surfaces for messages, and the ruggedness of extruded shapes, which provide both stiffening action and a fastening system. In manufacture, heavy gauge aluminum sheets are welded to extruded shapes. The technique sacrifices none of the structural characteristics now available in fully extruded signs, while making possible wider panels and a minimum of seams. The signs weigh about 2 lb. per square foot and will withstand winds up to 100 mph.

Aluminum Company of America, 737 Alcoa Building, Pittsburgh 19, Pa.

For more details circle 145 on  
Enclosed Return Postal Card.

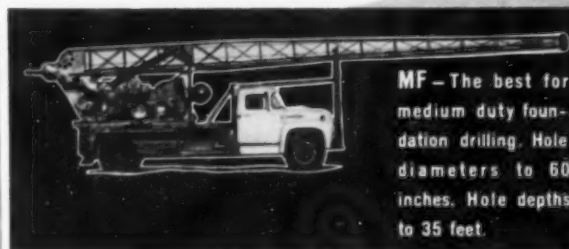
ROADS AND STREETS, May, 1958

# PORTABLE ECONOMICAL PROFITABLE

...A WILLIAMS DIGGER for every job!



**BDH Hole Diggers** are designed for electric Pole line holes and for light foundation drilling. Capacity 8 to 54 inches. Hole depths up to 25 feet.



**MF**—The best for medium duty foundation drilling. Hole diameters to 60 inches. Hole depths to 35 feet.

**MDHU A** medium duty digger for electric pole line construction. Hole diameters to 72 inches and hole depths to 20 feet.



**LDH** diggers are built for heavy duty power line construction or for large diameter shallow depth foundation drilling.



**LDH** Heavy duty foundation drill for hole diameters up to 96 inches and depths up to 55 feet.

WRITE FOR DESCRIPTIVE LITERATURE



**HUGH B. WILLIAMS  
MANUFACTURING CO.**

8330 Lovett Ave. Dallas, Texas

EXCLUSIVE DISTRIBUTORS

**JOSLYN MFG. & SUPPLY CO.** Dallas, Texas

... for more details circle 337 on enclosed return postal card

## Manual Motor Starter

A newly designed, size 1½ manual motor starter for single-phase applications up to 5 hp has been announced by General Electric. The new integral-horsepower starter is available for control of a-c single-phase motors rated 3 hp, 115 volts or 5 hp at 230 volts.

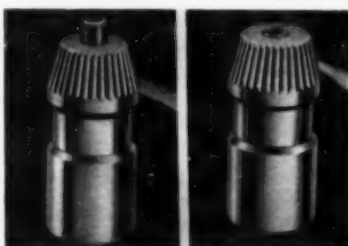
Listed by Underwriters Laboratory, Inc., the size 1½ device is also a 4-pole, size 1 starter with 2 poles wired in parallel on each side of the line.

General Electric Co., Schenectady 5, N.Y.

For more details circle 146 on Enclosed Return Postal Card.

## Tire Pressure Indicator

A red rod projecting from valve stem indicates correct pressure; disappearance of rod shows low; quick



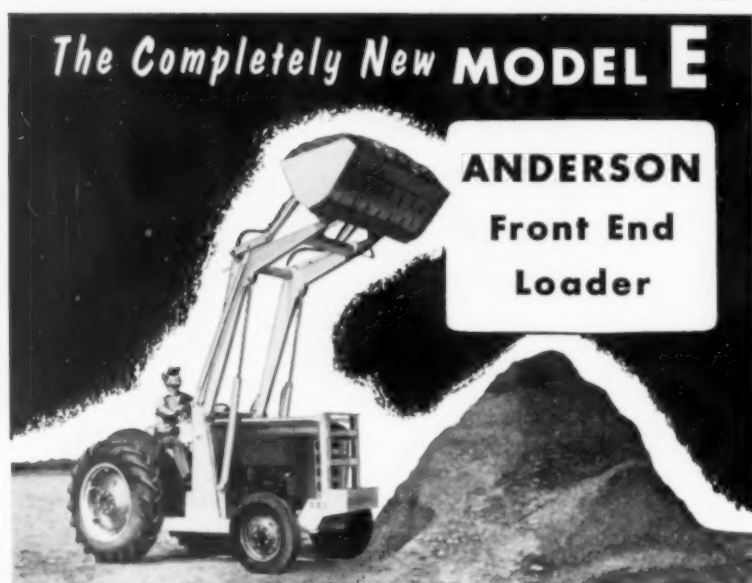
Frebank "No-Lo" Pressure Indicator

checking saves tire damage from under-inflation. This explains briefly the "No-Lo" pressure indicator now available for truck tires and soon to be marketed for passenger cars.

"No-Los" are pre-set at the factory in 5-lb. increments through a range from 40 to 105 lb., and in service are simply screwed onto the valve stem. A loss of 6 lb. or more gives the danger signal.

Frebank Company, 711 West Broadway, Glendale 4, Calif.

For more details circle 147 on Enclosed Return Postal Card.



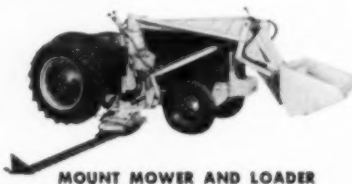
## All You Look For In Higher Priced Loaders

Skillful design and outstanding features make the new Anderson Model E the performance leader among loaders designed for utility tractors.

Clean, in-place breakaway under load . . . positive bucket filling . . . load carried high or low . . . these are only a few of the "on the job" extras found in this completely modern heavy-duty loader.

## Check these Performance Extras

- Full Load Carried at Any Height
- In-place Breakaway (roll back)
- Exclusive Hydraulic Shock Cushion
- Heavy Duty Construction
- Three Bucket Sizes
- Utility Tools



Write for new catalog.

WILDWOOD, N.J.

Manufactured by



HYDRAULIC MOWERS • HYDRAULIC LOADERS • FULL DOZERS

. . . for more details circle 240 on enclosed return postal card

## Truck Tractor

A new truck in production by Mack Trucks, Inc., is stated to have the shortest conventional heavy duty tractor cab arrangement ever developed in America. It measures only 89 in. from front of bumper to back of cab. The shorter dimension was developed to permit the use of longer trailers with larger payload capacity without exceeding the over-all length limits prescribed for tractor semi-trailer combinations. This was accomplished by



New Mack Truck

moving the B model contour cab forward and allowing the engine to project slightly into the cab. The new arrangement will be available in two tractor models; the B-66 and the B-67.

Mack Trucks, Inc., 1335 West Front St., Plainfield, N.J.

For more details circle 148 on Enclosed Return Postal Card.

## Backhoe Attachment

Full-cycle speed and a new "lifetime factor" in the 180-degree uninterrupted sway are important features claimed for the new Shawnee 88 backhoe attachment. The double-cylinder swing incorporates a heavy duty chain and sprocket. Cylinders are designed to afford lifetime automatic compensation for any wear in the swing mechanism, as a result of which there is never any play or need of adjusting.

The quick detachable bucket is an innovation on the Shawnee. A new linkage design enables one bucket to handle all types of jobs, including straight-down spot digging and truck loading. Buckets are available in widths from 16 in. to 36 in. The Shaw-





**Shawnee 88 Backhoe Attachment**

nee 88, in conjunction with the Shawnee line of loaders, is available for all light industrial utility tractors manufactured since 1939, including new makes and models.

Shawnee Mfg. Co., Inc., 1947 N. Topeka Ave., Topeka, Kansas.

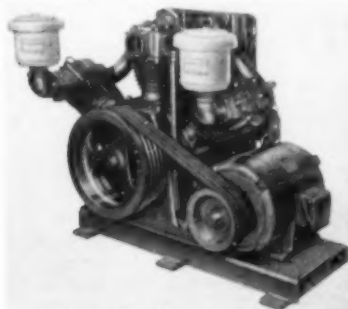
For more details circle 149 on Enclosed Return Postal Card.

### Stationary Compressor

An "all new" stationary air compressor, designed for today's trend toward higher pressures, has been announced by the Le Roi Division, Westinghouse Air Brake Co., designated the 25S2, it completes Le Roi's line of compressors from  $\frac{1}{2}$  to 100 hp. The new unit is rated for continuous duty at 175 psi, but is available also at 125 psi. Displacements are 120 cfm at 175 psi, and 870 rpm, and 133 cfm at 125 psi and 960 rpm.

Dimensions are 60 $\frac{1}{4}$ " in long, 37" in wide, 42" in high. Weight is 1810 lb. Balanced design is stated to reduce vibration and resulting noise to a minimum and to prevent wear to both compressor and motor.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.



**Le Roi 25S2 Compressor**

For more details circle 150 on Enclosed Return Postal Card.

*The chain tape that's  
truly called  
"DRAG TAPE"*



This tough, rugged chain tape is justifiably called a "drag tape". It withstands the rigors of daily field use in all kinds of terrain. It outlasts most other tapes because . . .

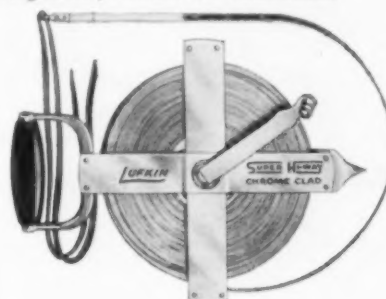
**It Has Raised Markings** and protective borders that are a part of the actual tape and will last as long as the tape itself.

**The Line Is  $\frac{3}{16}$ " Wide** of special analysis steel that resists kinking and breaking.

**It Is Chrome Clad<sup>®</sup>**, an all-metal finish. The line is built up with a series of electroplatings, with a final hard satin-chrome finish that is resistant to abrasion, rust and corrosion.

**It Is Easier To Read.** The raised markings stand out sharply against the jet-black background; cannot be obliterated by mud and dirt.

The **SUPER HI-WAY Drag Tape** is furnished in 100, 200 and 300 foot lengths, either with or without reels. Two leather end thongs and a chainman's conversion rule are supplied with each tape. Choice of three styles of end markings.

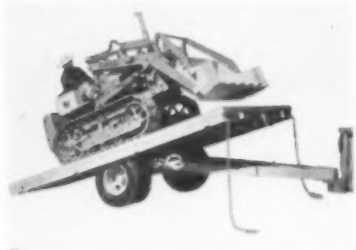


THE **LUFKIN** RULE COMPANY  
TAPES • RULES • PRECISION TOOLS  
SAGINAW, MICH. • MIDDLETOWN, N. Y. • BARRIE, ONT.

## Tilt-Top Trailer

The J. I. Case Co. is offering a new flat bed, 5-ton capacity, tilt-top trailer to purchasers of new Case wheel or "TerraTrac" crawler tractors. Designated the Model 90, the trailer can be hauled behind any light pick-up truck to move tractor quickly from job to job. One man can hitch trailer and load or unload tractor in less than two minutes. Trailer is equipped with safety brakes. Higher capacity Case trailers are also available for heavier "TerraTrac" models.

J. I. Case Co., Racine, Wis.



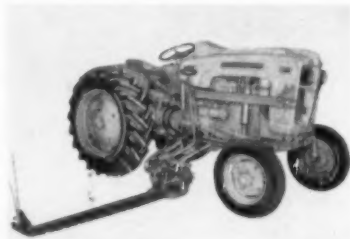
Model 90 Tilt-Top Trailer

For more details circle 151 on Enclosed Return Postal Card.

## Highway Mowers

A new side-mounted industrial mower with exclusive MM close-coupled

drive, hydraulic controls, high cutting speed, simplicity of mounting, and 135-degree cutting angle has been announced by Minneapolis-Moline as the Model SO industrial mower. It fits the MM 335 and 445 tractors.



Minneapolis-Moline SO Mower

The exclusive MM center power-takeoff located under the transmission housing drives the mower by a heavy-duty V-belt running directly from the pto pulley to the mower sheave—a distance of only 28½ in.

Snugly mounted on the side of the tractor, the new SO mower permits full visibility of the cutter bar, and cuts right up to the edge of the rear wheel tire track. Cutter bars are available in 5, 6 and 7-ft. sizes.

Minneapolis-Moline Co., P. O. Box 1050, Minneapolis 1, Minn.

For more details circle 152 on Enclosed Return Postal Card.

## Sideboom Attachment

A versatile sideboom attachment for its Model HO-Payload tractor shovel has been announced by The Frank G. Hough Co. Manufactured exclusively for the "Payload" by the Superior Equipment Co., Bucyrus, Ohio, the 10-ft. hydraulically controlled boom provides a maximum lifting capacity of 5½ tons.



Sideboom Attachment on "Payload"

The standard boom is easily adjusted in 2-ft. increments, telescoping from 10 to 16 ft. A hydraulically extended boom is also available. Positive precision control of the boom is available at all times through a unique device which eliminates danger to the operator from boom cables.

Frank G. Hough Co., 768 Seventh Ave., Libertyville, Ill.

For more details circle 153 on Enclosed Return Postal Card.



## SAND BLAST the easy RUEMELIN way!

A practical Sand Blast Generator for all types of outdoor cleaning work. Removes rust scale, paint. Cleans bridges, removes laitance from cement. Cleans ready-mix trucks and highway equipment prior to re-painting. Equipped with remote control with deadman valve for stop and start at the nozzle! Wet type nozzles also available if desired. Portable units can be equipped with hi-speed mountings for highway trailing. Write for descriptive bulletin.

### RUEMELIN MFG. CO.

MFRS. & ENGRS. • SAND BLAST & DUST COLLECTING EQUIPMENT  
3990 NORTH PALMER STREET • MILWAUKEE 13, WISCONSIN, U. S. A.

... for more details circle 318 on enclosed return postal card

AE 9403-1/2

## Four-Blade Trowler

A new White four-blade, 36-in. trowler, Model T-5, with 2¾ hp engine features four combination float and finish blades; instant pitch adjustment on the handle; a safety throttle control to immediately stop blade rotation, but not the engine, if the operator releases handle. It has a stationary guard ring to allow finishing within ¼ in. of walls and obstructions. The use of combination blades eliminates the necessity of changing from float to finish blades and greatly improves smoothness and stability.

H. White Mfg. Co., Elkhart, Ind.



White T-5 Trowler

For more details circle 154 on Enclosed Return Postal Card.



Front wheels of BROS SP-730 roller oscillate as a unit, rear wheels oscillate in pairs to accomplish uniform consolidation by kneading. For greater compactive forces are exerted than would be expected

under normal traffic. Finished mat has enough immediate stability to withstand effects of modern traffic and yet has maintained enough voids to provide flexibility.

## New BROS SP-730 (30-TON) PNEUMATIC ROLLER— Achieves Maximum Consolidation of Flexible Pavements

● In a search for better compaction of asphaltic mats, the State of Ohio adopted specifications in 1956 for a self-propelled rubber-tired roller capable of wheel loads and contact pressures above the maximum produced by legally loaded trucks.

One such roller which met the new specifications was tested in 1957 to determine if it would consolidate a newly laid asphaltic concrete mat to the extent that the finished pavement would be stable under modern heavy traffic and still have enough flexibility to respond to any subsequent subpavement movement.

It was a Bros Model SP-730 (Self-Propelled, 7 Rubber-Tired Wheels, 30 Tons Maximum Weight) with three wheels forward and four wheels in the rear. Construction of the mat in no way varied from standard methods except that the Bros rubber-tired roller was used in place of the steel tandem roller usually operated behind the initial roller.

The Bros roller was used on a project

in Licking County to construct a three inch asphaltic concrete binder course over a base of five inches of waterbound macadam on an eight inch granular sub-base.

IN-PLACE DENSITY TESTS ON THE COMPLETED MAT, CONDUCTED BY THE OHIO STATE HIGHWAY DEPARTMENT, SHOWED AN AVERAGE VOID CONTENT OF 4.01% AND AN AVERAGE DENSITY OF 100.99%! VARIATIONS IN DENSITY AND IN VOID WERE, FOR ALL PRACTICAL PURPOSES, ELIMINATED. (SEE TABLE.) AND, WHAT'S MORE, DESIGN DENSITY WAS ACCOMPLISHED BY ONLY ONE PASS OF THE ROLLER!

Results of this test and of a second test on a similar project in Clermont County (which showed an average void content of 3.71% and an average density of 101.28%) are now available on request.

Can your state afford *not* to get asphalt mat compaction results similar to those described? Send for the complete report today. You'll be on your way with initial compaction that's final . . . to greater, longer-lasting pavement stability than has ever before been possible!

**SP-730 RESULTS  
ON THE COMPACTION OF  
ASPHALTIC CONCRETE  
LICKING COUNTY, OHIO**

Percent Voids	Percent of Design Density	Position in Cross Section (From C)
4.40	100.60	10 ft. ft.
4.90	100.10	4 ft. ft.
3.08	99.92	on c
2.73	102.27	4 ft. ft.
2.34	102.66	10 ft. ft.
4.69	100.31	10 ft. ft.
3.02	101.98	4 ft. ft.
3.93	101.07	on c
4.40	100.60	4 ft. ft.
4.11	100.89	10 ft. ft.
2.13	102.87	10 ft. ft.
4.58	100.42	4 ft. ft.
6.18	98.82	on c
4.14	100.86	4 ft. ft.
3.54	101.46	10 ft. ft.
4.01	100.99	AVERAGE



### BROS Incorporated

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.  
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!



SHEEPSFOOT  
TAMPERS



STEAM GENERATOR



BITUMINOUS  
CIRCULATOR



VIBRA-PACTOR



9-TON SELF-  
PROPELLED ROLLER



9 AND 13-TON  
ROLLERS

## Hydraulic System Gauge

A new testing gauge for automotive and industrial hydraulic systems an-



MM "HI-Lo" Tester

nounced by Minneapolis-Moline, gives precision readings for both low pressure and high pressure. The high pressure gauge is accurately calibrated for readings from 250 to 3,000 psi, while the second gauge gives precision readings from zero to 400 psi.

Minneapolis-Moline Co., Box 1050, Minneapolis 1, Minn.

For more details circle 155 on Enclosed Return Postal Card.

## Tractor Push Block

A new accessory, the Shunk-Winget Spring Cushion Push Block, is designed

to minimize shocks and stresses between scrapers and push tractors. This is accomplished by means of powerful coil springs that absorb destructive contact shocks. On the largest model a tractive force of 58,000 lb. is required to compress the springs the 3 in. between stops.

All models are ruggedly constructed of heavy welded steel reinforced at points of stress. Wear plates are replaceable, and the block's face is 1/2-in. alloy steel backed by 7/8-in. steel plate.

Shunk Manufacturing Co., Bucyrus, O.



Shunk-Winget Spring Cushion Block Mounted for Pusher Service

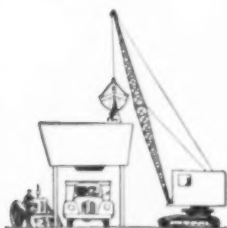
For more details circle 156 on Enclosed Return Postal Card.

# Athey 125 HiLoader

faster, more economical than a fleet of end loaders



or a 1 1/2 cu. yd. clamshell



Here's the stockpile loader that handles all types of materials — gravel, sand, stone, dirt — and out-produces two or three ordinary end loaders, loads more than a 1 1/2 yd. clamshell. The 125 HiLoader gives you *continuous* loading. Exclusive "Full-Floating

Feeder" assures steady production. Swiveling conveyor permits discharge up to 55° to right or left and directly behind. Unit handles up to 10 cu. yds. per minute of free-flowing materials. Your Athey-Caterpillar Dealer can show you on-the-job films of the 125. See him, or write Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

# Athey

LOADERS . . . BY THE LEADER

. . . for more details circle 237 on enclosed return postal card

## Close Quarter Roller

Below is pictured a final on-the-job testing of Gledhill's new roller, designed specifically to operate within 1/2 inch of obstacles. The unit has single lever control and is powered by a Wisconsin AENL 9.2-hp air-cooled engine. Main roll is 30 1/2 in. diameter by 36 in. wide, steering roll 20 1/2 x 30 in.



Gledhill's Close-Working Roller

Pressures with full water ballast are 85 lb. per lin. in. of drive roll and 30 lb. per lin. in. of steering roll. Both rolls have Timken bearings. A 120-gal sprinkler tank, twin spring-tensioned cleaning scrapers, and sprinkler mats on each roll are items.

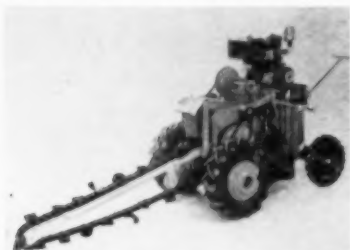
The Gledhill Road Machinery Co., Galion, Ohio

For more details circle 157 on Enclosed Return Postal Card.



## Trenching Machine

A new one-man operated trencher, the Arps, "Trench-Devil", model M, weighs approximately 815 lb. and can be easily loaded on pickup trucks or small trailers, or it can move short distances under its own power at 2½ mph. There are four digging widths—2¼ in., 4 in., 6 in. and 8 in., up to 42 in. deep.



Arps Corporation, New Holstein, Wis.

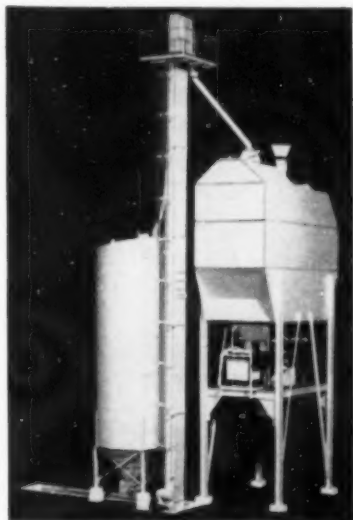
Digging speed is variable from 0 to 1200 ft. per hour. At the 30 in. depth, digging speed averages 120 ft. per hour with an 8 in. width; a 24 in. depth increases digging speed to 800 ft. per hour at the 4 in. width.

For more details circle 158 on Enclosed Return Postal Card.

## Mixer Loading Plant

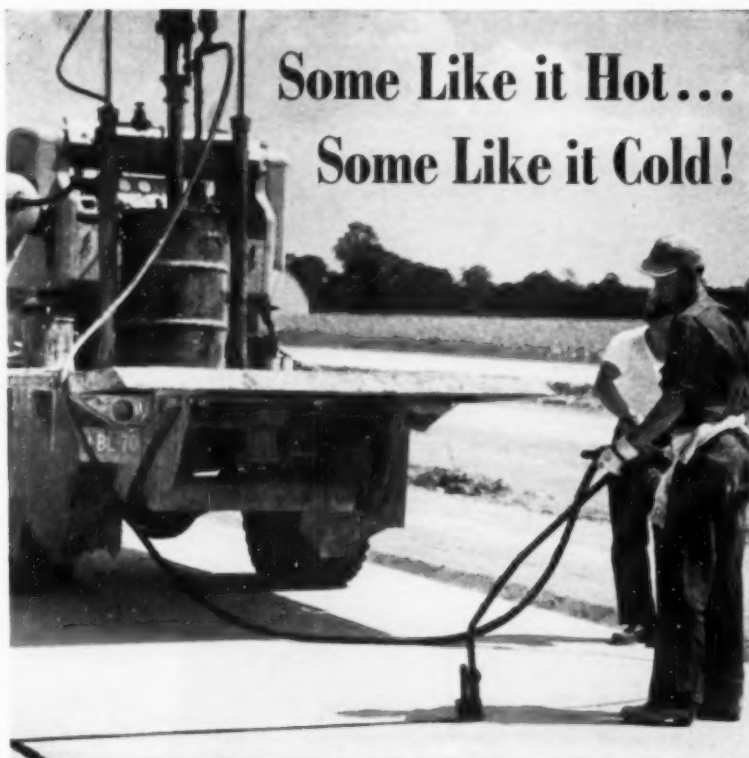
A new "Uni-Rect" truck mixer loading plant is designed for maximum capacity and portability. The "Model 200-222" plant features: 1. Factory assembled units that provide ample storage and fast, low cost erection 2. Pre-assembled and tested batching equipment. 3. Bin compartmentation that makes possible a wide and readily available variety of mix designs.

The seven-part, 200-ton capacity plant includes: a 3-cu. yd. automatic



Model 200-222 Mixer Loading Plant

ROADS AND STREETS, May, 1958



*but whatever your preference  
in paving joint sealers...  
you're sure of top quality performance*  
with **PRESSTITE-KEYSTONE**  
**Paving Products**

Whether you're a cold-applied advocate or a proponent of the hot pour—PRESSTITE-KEYSTONE offers you the latest and the finest in both types of paving joint sealers.

These two reliable names are your assurance of controlled quality, dependable delivery and a personalized engineering service. Add to this your advantages of one complete buying source, one convenient inventory and billing account, plus the big savings of mixed-carload shipment.

*make PRESSTITE-KEYSTONE your one-stop source  
for all your paving product needs*

- Presstite Cold-Applied Joint Sealer #67
- Presstite Cold Applied Jet Airfield Joint Sealer #99
- Kapco® Hot Pour Asphalt Rubber Joint Sealing Compound
- Kapco® Hot Pour Jet Airfield Joint Sealer
- Kapseal® Crack Filler

ALSO: All types of pre-formed Expansion Joints, Tongue & Groove Joints, Concrete Curing Compounds, etc.



A Division of AMERICAN-MARIETTA COMPANY  
3782 CHOUTEAU AVENUE, ST. LOUIS 10, MISSOURI

... for more details circle 316 on enclosed return postal card

batching unit; four 37-ton self cleaning aggregate compartments; two 150-bbl water tight cement compartments; two 300-bbl auxiliary cement compartments, and a cement elevator rated at 75 tph of cement having a density of 55 lb/cu. ft.

**Blaw-Knox Co., Construction Equipment Division, Mattoon, Ill.**

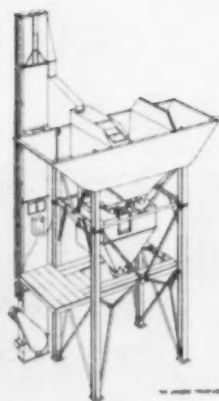
For more details circle 159 on Enclosed Return Postal Card.

## Transit Mix Plant

The New Johnson "Roustabout", portable transit mix plant, is quickly disassembled into 9-ft. maximum width sections and can be delivered to a different job site by truck. It has three aggregate compartments with a 38-cu. yd. total heaped capacity and one 60-bbl cement compartment.

Air for cement aeration, supplied by a built-in 3/4-hp air compressor, is introduced through built-in fittings and plug-in connections.

A manually operated high speed Johnson concentric batcher weighs cement on a scale separate from the aggregate scale. Cement is discharged within the aggregates for minimum dusting and maximum pre-mixing. The cement elevator is served from a boot hopper which either handles bagged cement or deliveries from rear-



"Roustabout" Transit Mix Plant

discharge trucks.

**C. S. Johnson Co., Champaign, Ill.**

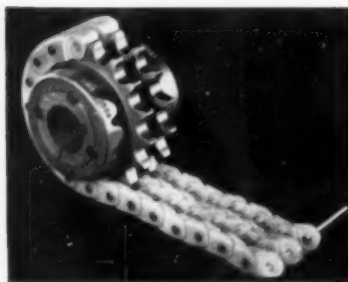
For more details circle 160 on Enclosed Return Postal Card.

## Nylon Chain Coupling

A new, lubrication-free nylon coupling has been added to the line of flexible couplings of Morse Chain Co. Completely corrosion-resistant, the chain element of the new coupling is constructed of nylon segments and stainless steel pins. It can be disassembled or connected at any link without special tools, and fits standard, stock steel roller chain sprockets. The new coupling needs no protective cover, handles loads from fractional to 40 hp and speeds from 500 to 5000 rpm.

**Morse Chain Co., Ithaca, N. Y.**

For more details circle 161 on Enclosed Return Postal Card.



Nylon Chain Coupling before Assembly. Links in rap easily around Sprocket and are Fastened with Stainless Steel Connecting Pins.

## Control for Sand Blasting

An entirely new control valve for use in sand blasting operations has been announced by Air Placement Equipment Co. The "Sand Saver," remote cut-off valve is designed for use with the "Airplaco" Jet-Blaster sandblast machine, and makes it possible for the



"Sand Saver" Control Valve

operator to completely shut off the flow of air and sand or other abrasive material at the nozzle when necessary to cease operation temporarily. Complete shut-off is accomplished without the use of remote controls connected to the sandblast machine itself. The "Sand-Saver" is a quick acting pinch valve with a replaceable rubber lining.

**Air Placement Equipment Co., 1009 West 24th St., Kansas City, Mo.**

For more details circle 162 on Enclosed Return Postal Card.

## Side Dump Bucket

The 2 1/4 cu. yd. side dumping bucket attachment, whose performance has been proven on the Caterpillar Nos 933 and 955 traxicators has been made available for the company's largest model Trax-cavator, the no. 977. The new bucket eliminates a great deal of the turning necessary for material loading, by allowing the loading and carrying vehicles to operate in parallel direction.

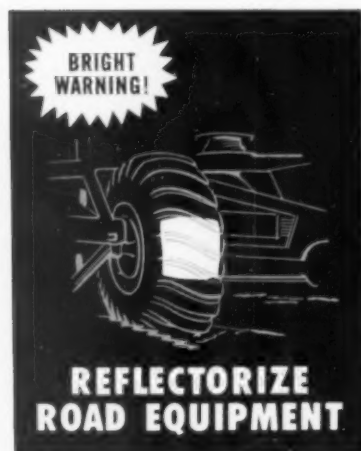


Side Dumping Bucket Attachment

Use of the same pins, bolts, and nuts as with the standard bucket simplifies installation and removal. There is no interference with the use of other Trax-cavator attachments.

**Caterpillar Tractor Co., Peoria, Ill.**

For more details circle 163 on Enclosed Return Postal Card.



... WITH A SPRAY OR BRUSH

"Codit" Reflective Liquid goes on fast by brush or spray. Hazards flash their own bright warning at night for safety. Reflectivity lasts up to 2 years. Buy your supply from your 3M Representative or write 3M Company, Dept. NR-58, St. Paul 6, Minnesota.



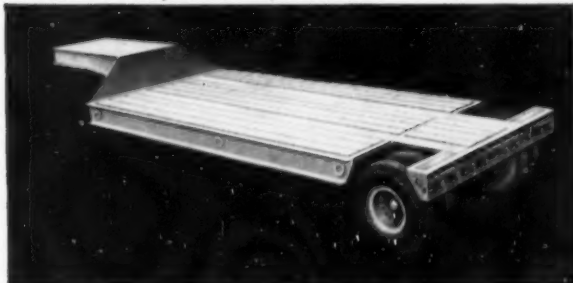
Get Codit Reflective Liquid in 6 oz. aerosol spray, 5 lb. can, or in complete safety kit.



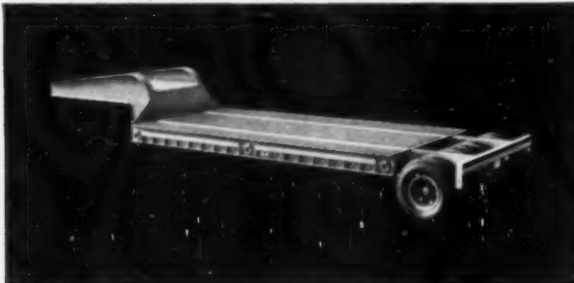
... for more details circle 307 on enclosed return postal card

# TRAILMOBILE'S COMPLETE LOW-BED LINE OFFERS YOU JUST THE RIGHT TRAILER FOR EVERY APPLICATION

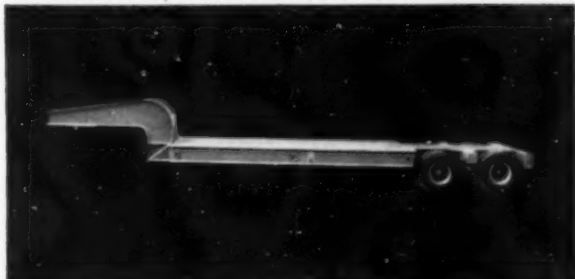
MODEL FS . . . Capacities—10, 15 tons



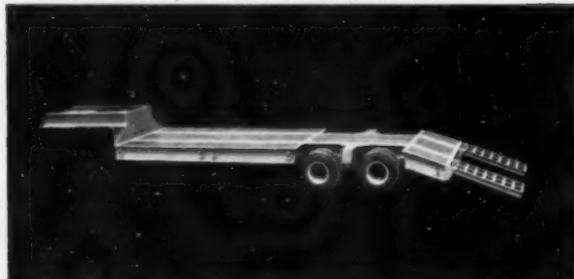
MODEL F . . . Capacities—15, 20, 25, 30 tons



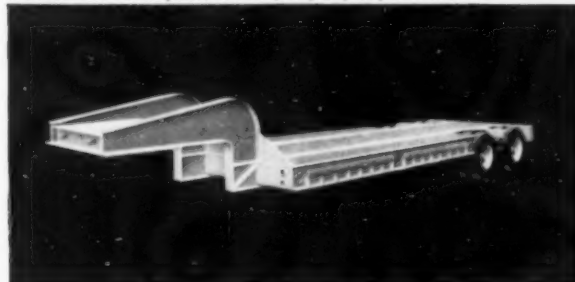
MODEL ZP . . . Capacities—15, 20, 25, 30, 35 tons



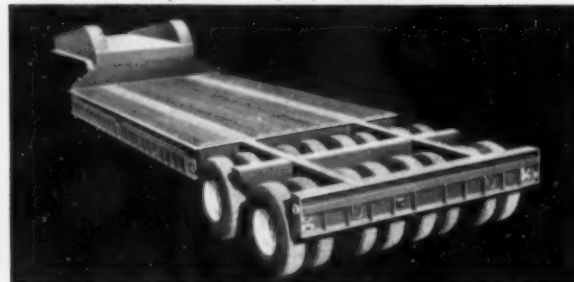
MODEL FZP . . . Capacities—20, 25, 30, 35 tons



MODEL FR . . . Capacities—15, 20, 25, 30, 35 tons

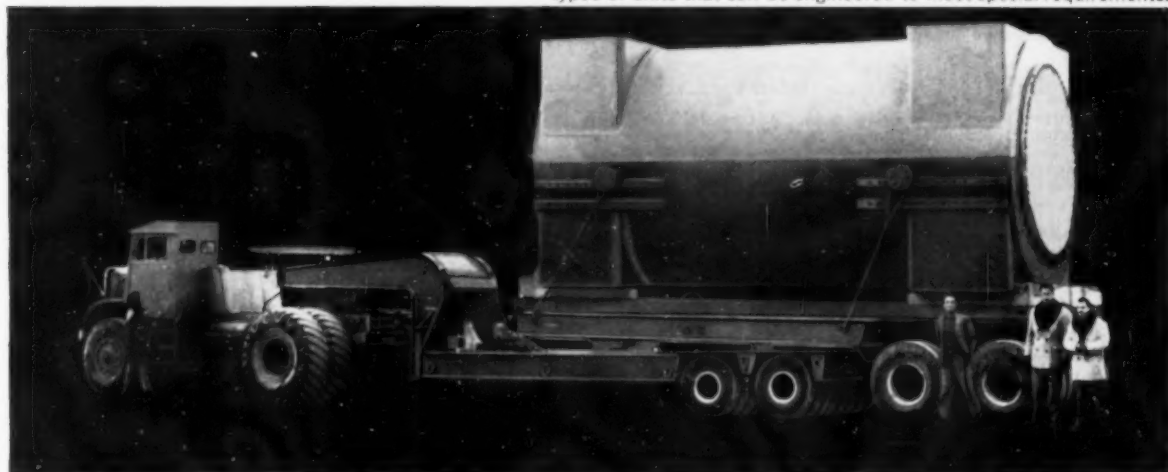


MODEL FC . . . Capacities—45, 50, 60, 75 tons



**EVEN 182 TONS . . .**

This specially built Trailmobile Low-Bed trailer is shown carrying a generator stator weighing 365,000 pounds. This is typical of the many types of units that can be engineered to meet special requirements.



**TRAILMOBILE INC.**  
CINCINNATI 9, OHIO • SPRINGFIELD, MISSOURI • LONGVIEW, TEXAS • BERKELEY 10, CALIF.

ROADS AND STREETS, May, 1958

. . . for more details circle 331 on enclosed return postal card

## Manufacturers' Literature

"ONE THIRD MILE PER HOUR is the title of a new 16-mm. sound film portraying construction of a soil cement roadway with a P&H "Single Pass" soil stabilizer. The film covers actual road building operations in Michigan, and tells a complete job story in 15 minutes. Of equal interest to road builders and general contractors, as well as to interested civic groups.

Available on request from Soil Stabilizer Division, Harnischfeger Corporation, 4400 West National Ave., Milwaukee 46, Wis.

For more details circle 164 on Enclosed Return Postal Card.

SAVERITE ENGINEERING CO., 158 - 14th, Hoboken, N. J., has published a bulletin on the maintenance of asphalt plant aggregate driers. It describes how, through the use of special refractory coatings, high temperature patching mortars and preventive maintenance, appreciable economies can be

effected. Factors such as flame impingement, thermal shock, proper refractory bricklaying and combustion control are dealt with.

For more details circle 165 on Enclosed Return Postal Card.

ALUMINUM AND ALUMINUM GRAPHITE PAINTS. A 4-page brochure available from the Paint Sales Division, Joseph Dixon Crucible Co., Jersey City 3, N. J., explains why aluminum and aluminum graphite paint gives high protective service on steel, galvanized iron and tin plate and other hard-used surfaces. Also featured are chips which show the actual colors of the different aluminum formulations.

For more details circle 166 on Enclosed Return Postal Card.

DRAFTING ROOM EQUIPMENT. Tables, racks, cabinets, and other equipment for drafting room service are pictured and fully described in a 24-page catalog just released by Stacor Equipment Co., 295 Emmet St., Newark 5, N. J.

For more details circle 167 on Enclosed Return Postal Card.

ASPHALT PLANTS AND PAVERS. Barber-Greene Co., Aurora, Ill., has issued an 8-page flier describing in brief text and pictures its 200-ton continuous asphalt plant; its "Batch-Omatic" plant with "Dyna-Mix" pugmill; Model 879-B paving finisher; Model 828 stabilization plant; Model 543 bucket loader and unloader; and the Model 774 wheel ditcher and Model 784 vertical boom ditcher.

For more details circle 168 on Enclosed Return Postal Card.

DIESEL TRACTOR CATALOGS: International Harvester Co., Construction Equipment Division, 180 N. Michigan Ave., Chicago 1, Illinois, has just issued separate 16-page catalogs covering three diesel crawler tractors—Form CR-628-H for the 42.3 drawbar hp TD-6; form CR-629-H for the 55.7 hp TD-9; and Form CR-630-H for the TD-14. Lists of matching equipment and attachments are included with descriptions and data for the respective units.

For more details circle 169 on Enclosed Return Postal Card.

BITUMINOUS DISTRIBUTORS are described in a 4-page brochure of City Tank Corp., Corona, N. Y. They are available in side-mounted, rear-mounted and in semi-trailer forms, with capacities of 1000 to 1430 gallons. Full on-starts and clean cutoff are provided by the exclusive 24-foot Cartwright spray bar. Ask for Brochure BD-1.

For more details circle 170 on Enclosed Return Postal Card.

**New!... Tassco increment sheet sign**

Toll Collecting Machines  
Have 25c In Coins Ready  
KEEP RIGHT

**low initial cost**  
**low erection cost**  
**lowest maintenance cost**

Here's a new all-aluminum sign developed especially for the large signs required on major expressways. The "Increment Sheet Sign" consists of aluminum increment sheets hung vertically on a supporting frame. It can be made in any height or width, and for ground or overhead installation. Each sheet engages with the adjacent sheet, providing a smooth-faced sign panel.

The advantages are obvious; new lows in the cost of material, installation and maintenance. The aluminum never needs painting or other costly maintenance. Erection is quick and easy. Reflective materials or painted backgrounds are available in any type letters or symbols. As for strength, the sign above, on New Jersey's Garden State Parkway, is designed to withstand wind in excess of 100 m.p.h.

Send today for new pamphlet with full engineering data.

**TASSCO**

### ONE RESPONSIBILITY TOO

Through our associate company, Pfaff & Kendall, Tassco can offer a complete range of standards and supports for ground signs and overhead spans to meet any requirement.

**TRAFFIC & STREET SIGN COMPANY**  
**84 Foundry Street, Newark 5, N. J.**

... for more details circle 332 on enclosed return postal card



BADGER DIVISION of The Warner & Swasey Co., Winona, Minn., has issued a new 12-page catalog covering the full "Hopto" line of hydraulic excavators. Illustrations show graphically the working ranges and specifications on all five "Hopto" models, ranging from  $\frac{1}{8}$  to  $\frac{1}{2}$  yd. capacity and from complete truck-mounted excavators to backhoes for mounting on tractors.

For more details circle 171 on Enclosed Return Postal Card.

INTERNATIONAL HARVESTER Co., 180 N. Michigan Ave., Chicago 4, Ill., has published a new catalog (CR-1067-14) on its 330 and 350 utility tractors, suggesting ways of mechanizing jobs often done by hand or by smaller tractors and equipment. Catalog covers important tractor features, including general tractor design, torque amplifier drive, fast-hitch method of coupling to implements and equipment. "Hydra-Touch" hydraulic system, independent power take-off, and power adjusted rear wheels. Special duty equipment for the tractors is illustrated.

For more details circle 172 on Enclosed Return Postal Card.

ONE USE DRILL BITS are described in a new 6-page bulletin (RD27) available from Sales Promotion Department, LeROI Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin. Bit construction and preparation of drill rod shanks are described. Illustrations show the offset gauge, thinner wings and steeper ream angles of the bits. Specifications list the different sizes and color codes of available bits.

For more details circle 173 on Enclosed Return Postal Card.

STREET AND HIGHWAY TRAFFIC SIGNS: A new 4-page folder, released by Grimco Stamp and Badge Co., 8102 Rosalie St., St. Louis 17, Mo., illustrates in color a complete line of street and highway traffic signs. Over 60 signs are pictured, and an additional 141 signs are priced and itemized.

For more details circle 174 on Enclosed Return Postal Card.

"ABC'S OF SOIL CEMENT STABILIZATION," a 36-page book, available from Pettibone-Mulliken Corporation, 4700 West Division St., Chicago 51, Ill., gives a fully illustrated treatment of every practical aspect of soil-cement stabilization. What is soil-cement? Where is it used? How is it best processed? What are the best operational procedures? Some of the questions answered are backed with helpful charts and typical job examples.

For more details circle 175 on Enclosed Return Postal Card.

## Acker LD core drills

"ALWAYS GET THEIR CORES!"



Acker's low-cost LD Core Drill was specifically designed for sensitive, hand lever feed drilling to permit even unskilled operators to recover core from broken difficult formations.

Even so, we were particularly gratified to learn from the Boring Soils & Testing Co., that their Acker LD Rig successfully obtained cores from extremely difficult coral rock

formations in Bermuda. This, despite the failure of other rigs to obtain cores!

The LD is completely self-contained and is available for jeep, trailer, truck or skid mounting. It makes diamond core drilling possible even in the roughest terrain!

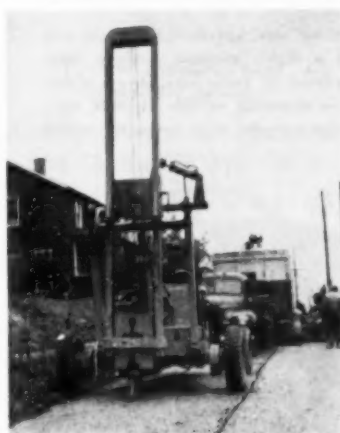
If you want more information about the Acker LD, please write for Bulletin 21, R&S.

## ACKER DRILL CO., Inc.

P.O. BOX 830 • SCRANTON, PA.

Over 40 years of experience manufacturing a complete line of diamond and shot core drills, accessories and equipment.

... for more details circle 234 on enclosed return postal card



Cutting asphalt pavement for Meadville Water Co., Meadville, Pa.

## CUT ASPHALT Easier

Right Down the Line  
with  
**ARROW Mobile  
HYDRAULIC HAMMERS**

- You will do a better job in less time and at a lower cost, and step up production with

**ARROW'S AUTOMATIC HAMMER CONTROL • POSITIVE IMPACT CONTROL  
EXCLUSIVE CREEPER DRIVE**

on such jobs as concrete-breaking—backfill tamping—asphalt cutting—driving posts and piling. Prove to yourself that ARROW MOBILE HYDRAULIC HAMMERS give you more of everything, dollar for dollar.

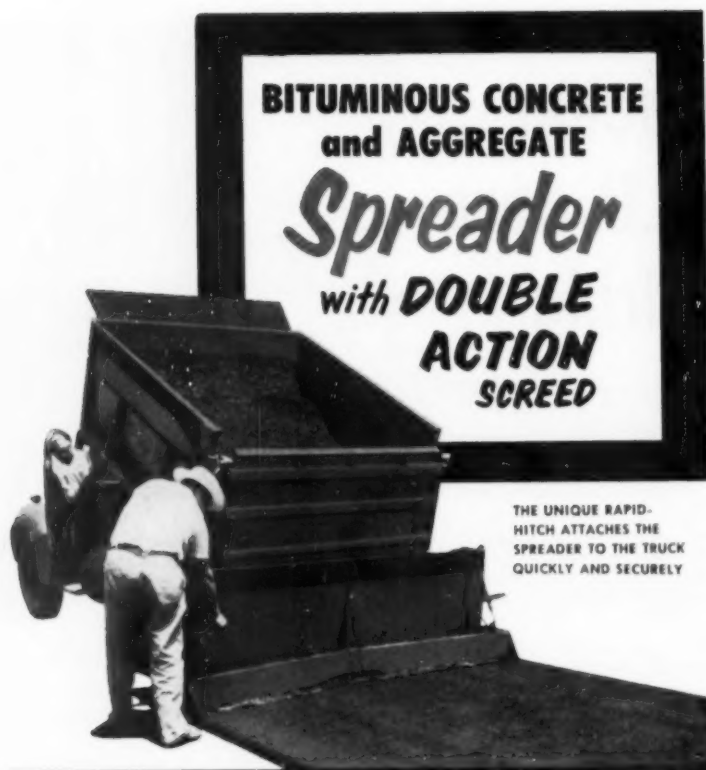
ASK YOUR DEALER FOR A DEMONSTRATION

*Arrow Manufacturing Company*

196 WEST DAKOTA

DENVER, COLORADO

... for more details circle 242 on enclosed return postal card



## BITUMINOUS CONCRETE and AGGREGATE

# Spreader with DOUBLE ACTION SCREED

THE UNIQUE RAPID-  
HITCH ATTACHES THE  
SPREADER TO THE TRUCK  
QUICKLY AND SECURELY

## GIVES AN EXTRA DENSE UNIFORMLY THICK LAYER WITH CROWN OR VALLEY!

Can be used for asphaltic concrete, pre-mix, caliche base, gravel, crushed rock and sandy top soil. The double-action gives you a highly compact, uniform layer that is exactly the same thickness from start to finish of every pass. Lays a radius as easily as driving a truck around the corner — absolutely no side slippage, and, you can pave right up to curbs and buildings. Out performs other spreaders costing much more.

# NEW!

## The BMCO CURBING MACHINE



SELF-PROPELLED,  
REQUIRES  
ONLY  
STEERING  
BY THE  
OPERATOR

FOR ASPHALTIC  
MATERIALS

WITH 6,000 POUND POSITIVE  
EXTRUSION FORCE THAT

## ELIMINATES CLOGGING

Easily lays up to 150 feet of 6" asphalt curb per hour... curb forms up to 12" high and 24" wide are easily interchanged... lays center line of curb within 9" of wall... eliminates the building of curb forms... produces high density curb that requires no packing... uses hot-mix asphaltic material and special mixes of Portland cement.



For Further Information,  
Phone, Write or Wire

**BROWNING MANUFACTURING CO.**

111 HUMBLE AVE. • P. O. BOX 2707

Walnut 3-4331 • SAN ANTONIO, TEXAS

... for more details circle 248 on enclosed return postal card

148

**READY-MIX CONCRETE TRUCK INFORMATION:** A new catalog, available from Sales Promotion Department, The White Motor Co., Cleveland 1, O. gives new factual data on truck applications for ready-concrete service. Catalog contains engineering data showing features to look for in the selection of a truck for service in the ready-mix industry. It includes information on power take-off application, and describes engineering features and construction used in the White 9000 chassis.

For more details circle 176 on  
Enclosed Return Postal Card

**"HOW TO BE A WIRE ROPE EXPERT,"** a new 16-page booklet, available from Advertising Department, Leschen Wire Rope Division, H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo., describes the basic principles for the selection of the proper wire rope for any job. Also illustrated in an ingenious device, the D/d ratio, for determining best relationship of rope size to drum. The more popular wire rope constructions are described, together with typical applications for which they are best suited.

For more details circle 178 on  
Enclosed Return Postal Card

**"ABRASIVE PRODUCTS BY CARBORUNDUM FOR THE CONSTRUCTION TRADES,"** a new 12-page pamphlet, available from Manager, Advertising, The Carborundum Co., P. O. Box 337, Niagara Falls, N.Y., lists available sizes and other information for masonry blades, diamond blades for concrete cutting, grinding wheels, abrasive rubs and stone, sandpaper sheets, discs and belts, and abrasive products for floor and stair installations.

For more details circle 179 on  
Enclosed Return Postal Card

## CLEARING HOUSE SECTION

### AUCTIONEERING

Edwin Small and Associates  
We handle any or all of your sales for your Liquidation, Bankruptcy, Foreclosure, Quitting Business. Sell the modern way by Public Auction. For more information contact:

**EDWIN SMALL**  
95 South Kansas St. • Russell, Kansas

## FOR SALE

**BACK HOE ATTACHMENTS . . . UNUSED GOVT SURPLUS!** For 3/4 Yard Bay City, Lorraine, Lima, Ensley, Bucyrus Erie, Unit, P & H, and Linkbelt. Equipped with 36" bucket and teeth.

SPECIAL \$1450.00 ea. f.o.b. Atlanta.

### FULTON EQUIPMENT COMPANY

2235 STEWART AVE. S.W.

ATLANTA 15, GA. POPULAR 7-8606

**ROADS AND STREETS, May, 1958**

# TWIN FACTS



a report on the  
cost-cutting performance  
of Euclid "Twins"

## Contractor completes road grading job with one Euclid "Twin"

After years of specializing in pipeline work, R. L. Eatherly Construction Co. of Nashville, Tennessee, decided to bid on a road grading job—got the contract to grade 3.2 miles of secondary road connecting U. S. 70 with Oak Ridge, Tenn. Since the company didn't have any rubber-tired earthmovers, a thorough study of all scraper makes and models was made.

Based on comparisons of productive capacity, operating costs and return on investment, a Euclid TS-24 Twin-Power Scraper was bought for the job. Although the 50,000 yd. project wasn't a big one, it was pretty tough scraper work because it involved shale, clay and rock, with many shallow cuts and fills. Eatherly counted on the self-loading ability and the easy maneuverability of the "Twin" for this job. Here's the result: the one-man earthmoving spread completed all of the dirtmoving in four weeks—finish grading as well as driveway work for property owners along the three and a quarter miles of right of way!

Operator Tommy Swann summed up the "Twin's" performance this way: "I've operated them all and there's nothing like this 'Euc'." If you don't have current information on the TS-24, be sure to get in touch with your Euclid dealer for some interesting facts and figures.

**EUCLID DIVISION, General  
Motors Corp., Cleveland 17, Ohio**

For more details circle 273 on  
enclosed return postal card.

**ROADS AND STREETS, May, 1958**

## CLEARING HOUSE SECTION FOR SALE

- 1—Buffalo-Springfield 3 wheel  
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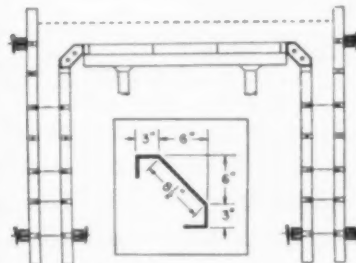
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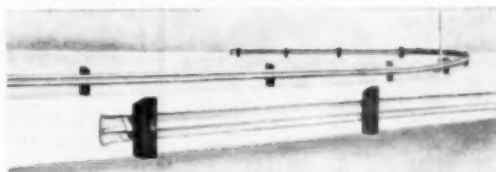
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"We have a very satisfied operator!"



It takes *both* men and machines to get a tough job done by contract date. That's why you get better production if a machine is good enough to satisfy the experienced operator who handles it. Asst. Supt. W. B. Siviter of Birsch Construction Corp. of Norfolk, Va., reports he has a very happy operator. It's a safe guess that the machine in question is a CAT\* Motor Grader—like the rugged No. 112.

Mr. Siviter said it was his operators who recommended buying the maneuverable and dependable No. 112, shown windrowing near Smithfield, Va., on Route 10. The job of widening this narrow sand and dirt road to 16' of hard surface called for an average of 8' of widening. Says Supt. Siviter of his Caterpillar Motor Grader: "Does everything we expected it to do!"

Operators will be more pleased—and efficient—due to improvements on the No. 112. An adjustable seat and a taller cab with better ventilation and more

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window area than ever before assure less operator fatigue, more production.

The Cat No. 112 Motor Grader also has newly designed front axle components for extra strength and longer life. As before, its frame is made from special channels, with box section reinforcements to handle the toughest work conditions. And its Caterpillar Diesel Engine's reputation for lugging hard without fouling is well earned.

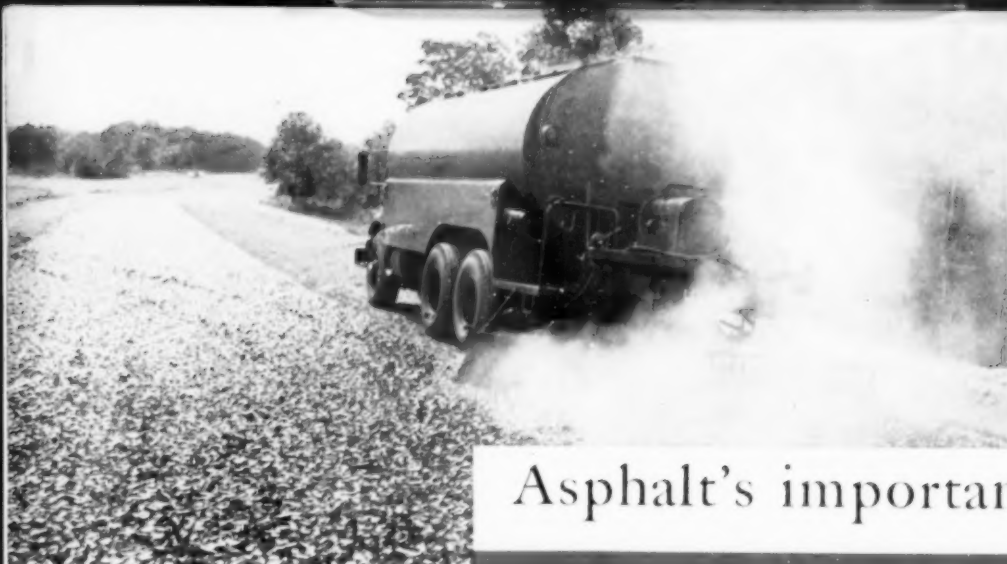
For details contact your Caterpillar Dealer—the same man you see for genuine replacement parts—parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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WILL DEMONSTRATE**



Pressure distributor applies hot Texaco Asphalt to 3-inch compacted layer broken stone, forming upper course foundation.

## Asphalt's important role on new Connecticut Turnpike



Hot-mix Texaco Asphaltic Concrete wearing surface was laid in two courses with combined thickness of 3½ inches.

These contractors paved a large mileage of the Connecticut Turnpike with Texaco Asphalt:

L. G. DeFelice & Son  
D. V. Frione  
M. A. Gammino Const. Co.  
Guyott Company  
Lane Construction Co.

The 129-mile Connecticut Turnpike, newest American toll road, links New York State and Rhode Island. Asphalt was called upon to play a varied, as well as a leading, part in the construction of this important expressway.

**Asphalt Pavement:** 69 miles of the turnpike have a 3½-inch hot-mix Asphaltic Concrete surface on a 3-inch Asphalt Penetration Macadam base. Supporting the asphalt portion of the pavement is a 4-inch course of dry-bound macadam with sand filler, over an 11 to 23 inch gravel subbase.

**Asphalt Shoulders:** Either hot-mix Asphaltic Concrete or Asphalt Penetration Macadam shoulders were constructed for the full length of the toll road.

**Asphalt Curb:** This turnpike is another example of the use of asphalt to provide durable, economical curbing.

Selected for many of the nation's modern, heavily traveled turnpikes, asphalt also is the logical pavement for the 41,000-mile Interstate Highway System. It combines rugged durability under heaviest traffic loads, unequalled riding comfort because of its resilient, joint-free surface, with a substantial saving in first cost—plus other important advantages.

Texaco Asphalt, used in paving a large mileage of the Connecticut Turnpike, also offers the road builder a number of intermediate and low-cost types of asphalt construction for roads, streets, airports and parking areas. Helpful information on these types is supplied in two free Texaco booklets. Copies can be obtained with no obligation by writing our nearest office.

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